Appendix A
DEQ Application Forms

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/26/07

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION	
1. Company Name	St Lukes Regional Medical Center, Inc. (An Idaho non-profit corporation)
2. Facility Name (if different than #1)	St Lukes Magic Valley Medical Center
3. Facility I.D. No.	
4. Brief Project Description:	
FACILITY INFORMATION	
5. Owned/operated by: (√ if applicable)	☐ Federal government ☐ County government ☐ State government ☐ City government
6. Primary Facility Permit Contact Person/Title	Doug Hamrick, Facilities Manager
7. Telephone Number and Email Address	208.737.2932, dough@mvrmc.org
8. Alternate Facility Contact Person/Title	Jeff Hull, Director
9. Telephone Number and Email Address	208.381.2023
10. A ddress to which permit should be sent	St. Lukes Regional Medical Center, Attn: Jeff Hull, 190 E. Bannock
11. Cit y/State/Zip	Boise, ID 83712
12. Equi pment Location Address (if different than #10)	1600 N. Grandview Dr.
13. Cit y/State/Zip	Twin Falls, Idaho, 83301
14. Is t he Equipment Portable?	☐ Yes ☒ No
15. SIC Co de(s) and NAISC Code	Primary SIC: 8062 Secondary SIC (if any): NAICS: 622110
16. Brief B usiness Description and Principal Product	New Full Service Hospital
17. Ide ntify any adjacent or contiguous facility that this company owns and/or operates	NA
PERMIT APPLICATION TYPE	
18. Spec ify Reason for Application	☒ New Facility ☐ New Source at Existing Facility ☐ Unpermitted Existing Source ☐ Modify Existing Source: Permit No.:_____ Date Issued: _____ ☐ Permit Revision ☐ Required by Enforcement Action: Case No.:_____

CERTIFICATION

IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE.

19. Respon sible Official's Name/Title	Jeff Hull, Director	
20. RESPONSIBLE OFFICIAL SIGNATURE		Date: 5/7/07
21. ☒ Check here to indicate you would like to review a draft permit prior to final issuance.		

DEQ AIR QUALITY PROGRAM
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PERMIT TO CONSTRUCT APPLICATION

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04/03/07

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DEQ USE ONLY
Date Received
Project Number
Payment / Fees Included? Yes ☐ No ☐
Check Number

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER

1. Company Name	St. Lukes Regional Medical Center	
2. Facility Name	St Lukes Magic Valley Medical Center	3. Facility ID No.
4. Brief Project Description - One sentence or less	New full service hospital	

PERMIT APPLICATION TYPE

5. ☒ New Facility ☐ New Source at Existing Facility ☐ Unpermitted Existing Source
☐ Modify Existing Source: Permit No.:_____ Date Issued:_____
☐ Required by Enforcement Action: Case No.:_____

6. ☒ Minor PTC ☐ Major PTC

FORMS INCLUDED

Included	N/A	Forms	DEQ Verify
☒	☐	Form GI – Facility Information	☐
☒	☐	Form EU0 – Emissions Units General	☐
☐	☒	Form EU1 - Industrial Engine Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU2 - Nonmetallic Mineral Processing Plants Please Specify number of forms attached: _____	☐
☐	☒	Form EU3 - Spray Paint Booth Information Please Specify number of forms attached: _____	☐
☒	☐	Form EU4 - Cooling Tower Information Please Specify number of forms attached: _____	☐
☒	☐	Form EU5 – Boiler Information Please Specify number of forms attached: _____	☐
☐	☒	Form HMAP – Hot Mix Asphalt Plant Please Specify number of forms attached: _____	☐
☐	☒	Form CBP - Concrete Batch Plant Please Specify number of forms attached: _____	☐
☐	☒	Form BCE - Baghouses Control Equipment	☐
☐	☒	Form SCE - Scrubbers Control Equipment	☐
☒	☐	Forms EI-CP1 - EI-CP4 - Emissions Inventory– criteria pollutants (Excel workbook, all 4 worksheets)	☐
☒	☐	PP – Plot Plan	☐
☒	☐	Forms MI1 – MI4 – Modeling (Excel workbook, all 4 worksheets)	☐
☒	☐	Form FRA – Federal Regulation Applicability	☐

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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
St Lukes Regional Medical Center	St Lukes Magic Valley Medical Center	
Brief Project Description:	New full service hospital	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	300 KW GENERATOR
2. EU ID Number:	GEN1
3. EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	CATERPILLAR
5. Model:	
6. Maximum Capacity:	300 KW/449 HP
7. Date of Construction:	6/2007
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	
19. Maximum Operation	500 HR/YR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☒ Operation Hour Limit(s):	6 HR/DAY - LOAD BANK TEST
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	STANDBY GEN/MAINTENANCE TESTING ONLY

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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
St Lukes Regional Medical Center	St Lukes Magic Valley Medical Center	
Brief Project Description:	New full service hospital	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	1500 KW GENERATOR
2. EU ID Number:	GEN2
3. EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	CATERPILLAR
5. Model:	3512C
6. Maximum Capacity:	1500 KW/2,206 HP
7. Date of Construction:	6/2007
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	
19. Maximum Operation	200 HR/YR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☒ Operation Hour Limit(s):	200 HR/YR, 6 HR/DAY - LOAD BANK TESTING
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	STANDBY GEN/MAINTENANCE TESTING ONLY

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IDENTIFICATION		
Company Name: St Lukes Regional Medical Center	Facility Name: St Lukes Magic Valley Medical Center	Facility ID No:
Brief Project Description:	New full service hospital	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION	
1. Emissions Unit (EU) Name:	1500 KW GENERATOR
2. EU ID Number:	GEN3
3. EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	CATERPILLAR
5. Model:	3512C
6. Maximum Capacity:	1500 KW/2,206 HP
7. Date of Construction:	6/2007
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT			
10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)	
18. Actual Operation	
19. Maximum Operation	200 HR/YR

REQUESTED LIMITS	
20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☒ Operation Hour Limit(s):	200 HR/YR, 6 HR/DAY- LOAD BANK TESTING
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	STANDBY GEN/MAINTENANCE TESTING ONLY

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IDENTIFICATION		
Company Name: St Lukes Regional Medical Center	Facility Name: St Lukes Magic Valley Medical Center	Facility ID No:
Brief Project Description:	New full service hospital	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION	
1. Emissions Unit (EU) Name:	1500 KW GENERATOR
2. EU ID Number:	GEN4
3. EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	CATERPILLAR
5. Model:	3512C
6. Maximum Capacity:	1500 KW/2,206 HP
7. Date of Construction:	6/2007
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT			
10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)	
18. Actual Operation	
19. Maximum Operation	200 HR/YR

REQUESTED LIMITS	
20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☒ Operation Hour Limit(s):	200 HR/YR, 6 HR/DAY - LOAD BANK TESTING
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	STANDBY GEN/MAINTENANCE TESTING ONLY

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IDENTIFICATION

Company Name:	Facility Name:	Facility ID No:
St Lukes Regional Medical Center	St Lukes Magic Valley Medical Center	
Brief Project Description:	New full service hospital	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

1. Emissions Unit (EU) Name:	1500 KW GENERATOR
2. EU ID Number:	GEN5
3. EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	CATERPILLAR
5. Model:	3512C
6. Maximum Capacity:	1500 KW/2,206 HP
7. Date of Construction:	6/2007
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT

10. Control Equipment Name and ID:			
11. Date of Installation:		12. Date of Modification (if any):	
13. Manufacturer and Model Number:			
14. ID(s) of Emission Unit Controlled:			
15. Is operating schedule different than emission units(s) involved?	☐ Yes ☐ No		
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☐ No (If Yes, attach and label manufacturer guarantee)		

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

18. Actual Operation	
19. Maximum Operation	200 HR/YR

REQUESTED LIMITS

20. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, check all that apply below)
☒ Operation Hour Limit(s):	200 HR/YR, 6 HR/DAY - LOAD BANK TESTING
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	STANDBY GEN/MAINTENANCE TESTING ONLY

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PERMIT TO CONSTRUCT APPLICATION

Revision 3
04/02/07

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IDENTIFICATION		
Company Name: St Lukes Regional Medical Center	Facility Name: St Lukes Magic Valley Medical Center	Facility ID No:
Brief Project Description:	New Full Service Hospital	

COOLING TOWER IDENTIFICATION AND DESCRIPTION				
	Tower 1	Tower 2	Tower 3	Tower 4
1. Emission Unit Name	Cooling Tower 1	Cooling Tower 2		
2. Emission Unit ID Number	WCT1	WCT2		
3. Stack/Vent ID Number				
4. Tower Type (N: New, U: Unpermitted, M: Modification)	☒ N, ☐ U, ☐ M	☒ N, ☐ U, ☐ M	☐ N, ☐ U, ☐ M	☐ N, ☐ U, ☐ M
5. Current Permit Number				
6. Tower Construction Date	6/2007	6/2007		
7. Tower Manufacturer				
8. Tower Model Number				
9. Number of Cells in Tower				
10. Tower Maximum Water Flow Rate	5,000 gal/min	5,000 gal/min		
11. Measured TDS Content (if known)	580 ppm	580-ppm		
12. Do you use additives in the water? If Yes, provide an MSDS form for each additive	☒ No ☐ Yes	☒ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
CONTROL EQUIPMENT INFORMATION				
13. Control Equipment	☒ No ☐ Yes	☒ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
14. Control Equipment ID Number				
15. Control Equipment Efficiency				
OPERATING SCHEDULE				
16. Actual Operation (hours per year)				
17. Maximum Operation (hours per year)				

Comment [JB1]: Phyllis, I made the font in this cell 0.5 point smaller so it would fit on one line.

REQUEST FOR PERMIT LIMITATIONS				
18. Are you requesting any permit limits?	☒ No ☐ Yes. If Yes, fill in all that apply below.			
Tower Served	Operation Hour Limits:	TDS Limits (ppm):	Material Usage Limits:	Other:
Tower 1				
Tower 2				
Tower 3				
Tower 4				
19. Rationale for Requesting the Limit(s):				

Comment [JB2]: Same here-- 0.5 point smaller so it would fit on one line.

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IDENTIFICATION		
Company Name: St Lukes Regional Medical Center	Facility Name: St Lukes Magic Valley Medical Center	Facility ID No:
Brief Project Description:	New Full Service Hospital	

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

1. Type of Request: ☒ New Unit ☐ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:

2. Use of Boiler: ☐ % Used For Process ☒ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other:

3. Boiler ID Number:	4. Rated Capacity: ☒ 2.0 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
5. Construction Date: 6/2007	6. Manufacturer: Fulton Pulse	7. Model: 2000
8. Date of Modification (if applicable):	9. Serial Number (if available):	10. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

11. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☒ Other Fuels (unit: /hr)
12. Full Load Consumption Rate				
13. Actual Consumption Rate				
14. Fuel Heat Content (Btu/unit, LHV)		1,020 Btu/scf		Propane 91.5 MMBtu/1,000 gal
15. Sulfur Content wt%				
16. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

17. Steam Heat Content	NA	NA		
18. Steam Temperature (°F)	N/A	N/A		
19. Steam Pressure (psi)	N/A	N/A		
20. Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): NG- 8,760 hr/yr, backup fuel propane 96 hr/yr

22. Operating Schedule (hours/day, months/year, etc.): NG - 8,760 hr/yr

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IDENTIFICATION		
Company Name: St Lukes Regional Medical Center	Facility Name: St Lukes Magic Valley Medical Center	Facility ID No:
Brief Project Description:	New Full Service Hospital	

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

1. Type of Request: ☒ New Unit ☐ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:

2. Use of Boiler: ☒ % Used For Process ☐ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other:

3. Boiler ID Number:	4. Rated Capacity: ☒ 4.2 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
5. Construction Date: 6/2007	6. Manufacturer: Hurst	7. Model: 4VT Cyclone Series
8. Date of Modification (if applicable):	9. Serial Number (if available):	10. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

11. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☒ Other Fuels (unit: /hr)
12. Full Load Consumption Rate				
13. Actual Consumption Rate				
14. Fuel Heat Content (Btu/unit, LHV)		1,020 Btu/scf		Propane 91.5 MMBtu/1000 gal
15. Sulfur Content wt%				
16. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

17. Steam Heat Content	NA	NA		
18. Steam Temperature (°F)	N/A	N/A		
19. Steam Pressure (psi)	N/A	N/A		
20. Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): NG 8,760 hr/yr, propane backup fuel 96 hr/yr

22. Operating Schedule (hours/day, months/year, etc.): NG -8,760 hr/yr

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Company Name:	**St Lukes Regional Medical Center**
Facility Name:	St Lukes Magic Valley Medical Center
Facility ID No.:	
Brief Project Description:	New Full Service Hospital

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - POINT SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	**Stack ID**	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													
300 kW Generator	GEN1	0.03	0.01	0.92	0.23	4.07	1.02	0.25	0.06	0.06	0.01		
Hospital Heat Boiler-NG	HBOIL1	0.24	1.04	0.02	0.08	1.57	6.87	2.64	11.54	0.17	0.76		
Hospital Heat Boiler-Propane	HBOIL1P	0.14	0.01	0.02	0.00	4.90	0.24	0.66	0.03	0.17	0.01		
Hospital Steam Boiler-NG	SBOIL2	0.12	0.55	0.01	0.04	0.82	3.59	1.38	6.04	0.09	0.40		
Hospital Steam Boiler-Propane	SBOIL2P	0.07	0.00	0.00	0.00	2.57	0.12	0.35	0.02	0.09	0.00		
1500 kW Generator	GEN2	0.20	0.02	8.92	0.89	28.98	2.90	3.95	0.40	0.71	0.07		
1500 kW Generator	GEN3	0.20	0.02	8.92	0.89	28.98	2.90	3.95	0.40	0.71	0.07		
1500 kW Generator	GEN4	0.20	0.02	8.92	0.89	28.98	2.90	3.95	0.40	0.71	0.07		
1500 kW Generator	GEN5	0.20	0.02	8.92	0.89	28.98	2.90	3.95	0.40	0.71	0.07		
Water Cooling Tower 1	WCT1	0.29	1.27										
Water Cooling Tower 2	WCT2	0.29	1.27										
12,000 Gallon Jet Fuel UST	UST-12000									0.03	0.13		
15,000 Gallon Diesel UST	UST-Die 1									0.00	0.00		
15,000 Gallon Diesel UST	UST-Die 2									0.00	0.00		
15,000 Gallon Diesel UST	UST-Die 3									0.00	0.00		
15,000 Gallon Diesel UST	UST-Die 4									0.00	0.00		
(insert more rows as needed)													
Total		1.98	4.23	36.65	3.91	129.85	23.44	21.08	19.29	3.45	1.59		

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 3 04/05/2007

Please see instructions on page 2 before filling out the form.

Company Name:	St Lukes Regional Medical Center
Facility Name:	St Lukes Magic Valley Medical Center
Facility ID No.:	
Brief Project Description:	New Full Service Hospital

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

		1.		2.	3.	4.		5.
Criteria Pollutants	**Averaging Period**	**Significant Impact Analysis Results (µg/m3)**	**Significant Contribution Level (µg/m3)**	**Full Impact Analysis Results (µg/m3)**	**Background Concentration (µg/m3)**	**Total Ambient Impact (µg/m3)**	**NAAQS (µg/m3)**	**Percent of NAAQS**
PM_{10}	24-hour		5	42.30	55.00	97.30	150	65%
	Annual		1	10.90	26.00	36.90	50	74%
SO_2	3-hr		25	576.00	120.00	696.00	1300	54%
	24-hr		5	318.30	40.00	358.30	365	98%
	Annual		1	6.80	10.00	16.80	80	21%
NO_2	Annual		1	53.40	40.00	93.40	100	93%
CO	1-hr		2000	1,184.00	13,800.00	14,984.00	40000	37%
	8-hr		500	696.40	4,600.00	5,296.40	10000	53%

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 3 03/27/2007

Please see instructions on page 2 before filling out the form.

Company Name:	St Lukes Regional Medical Center
Facility Name:	St Lukes Magic Valley Medical Center
Facility ID No.:	
Brief Project Description:	New Full Service Hospital

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Stack Height (m)**	**Modeled Diameter (m)**	**Stack Exit Temperature (K)**	**Stack Exit Flowrate (acfm)**	**Stack Exit Velocity (m/s)**	**Stack orientation (e.g., horizontal, rain cap)**
Point Source(s)										
Heat Boiler	HBOIL1	#########	#########	1,104.80	10.06	0.71	378.15	10,481.33	12.51	Vertical
Steam Boiler	HBOIL2	#########	#########	1,104.80	10.06	0.56	477.59	5,221.00	10.05	Vertical
300 kW Generator	GEN1	#########	#########	1,106.20	14.63	0.13	711.76	1,322.97	47.10	Vertical
1500 kW Generator #1	GEN2	#########	#########	1,104.80	10.06	0.20	635.04	5,710.12	85.89	Vertical
1500 kW Generator #2	GEN3	#########	#########	1,104.80	10.06	0.20	635.04	5,710.12	85.89	Vertical
1500 kW Generator #3	GEN4	#########	#########	1,104.80	10.06	0.20	635.04	5,710.12	85.89	Vertical
1500 kW Generator #4	GEN5	#########	#########	1,104.80	10.06	0.20	635.04	5,710.12	85.89	Vertical

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 3 4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	St Lukes Regional Medical Center
Facility Name:	St Lukes Magic Valley Medical Center
Facility ID No.:	
Brief Project Description:	New Full Service Hospital

FUGITIVE SOURCE PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	Stack ID	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Angle from North (°)	Initial Vertical Dimension (m)	Initial Horizontal Dimension (m)
Area Source(s)										
UST 12000	UST12000	705,408.00	##########	1,104.90	3.66		0.05			
Volume Source(s)										
Water Cooling Fan #1	WCT1	705,292.50	##########	1,104.80	4.24				1.97	0.79
Water Cooling Fan #2	WCT2	705,288.30	##########	1,104.80	4.24				1.97	0.79

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	St Lukes Regional Medical Center
Facility Name:	St Lukes Magic Valley Medical Center
Facility ID No.:	
Brief Project Description:	New Full Service Hospital

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	**Length (ft)**	**Width (ft)**	**Base Elevation (m)**	**Building Height (m)**	**Number of Tiers**	**Description/Comments**
Heat Plant	157.00	95.00	1104.70	7.62	1	
Inpatient	285.00	259.00	1105.40	18.29	1	
Diagnostic	413.00	220.00	1105.50	13.72	1	
Waiting	66.00	43.00	1105.50	4.57	1	
Office	164.00	194.00	1106.10	13.72	1	
MSTI	243.00	266.00	1105.30	4.57	1	

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 2
02/14/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: St. Lukes Regional Medical Center	Facility Name: St. Lukes Magic Valley Medical Center	Facility ID No:
Brief Project Description: New Full Service Hospital		

APPLICABILITY DETERMINATION		
1. Will this project be subject to 1990 CAA Section 112(g)? (Case-by-Case MACT)	☒ NO	☐ YES* * If YES then applicant must submit an application for a case-by-case MACT determination [IAC 567 22-1(3)"b" (8)]
2. Will this project be subject to a New Source Performance Standard? (40 CFR part 60)	☒ NO	☐ YES* *If YES please identify sub-part: _____
3. Will this project be subject to a MACT (Maximum Achievable Control Technology) regulation? (40 CFR part 63) THIS ONLY APPLIES IF THE PROJECT EMITS A HAZARDOUS AIR POLLUTANT	☒ NO	☐ YES* *If YES please identify sub-part: _____
4. Will this project be subject to a NESHAP (National Emission Standards for Hazardous Air Pollutants) regulation? (40 CFR part 61)	☒ NO	☐ YES* *If YES please identify sub-part: _____
5. Will this project be subject to PSD (Prevention of Significant Deterioration)? (40 CFR section 52.21)	☒ NO	☐ YES
6. Was netting done for this project to avoid PSD?	☒ NO	☐ YES* *If YES please attach netting calculations

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT

Appendix B
Public Meeting Announcement

LEGAL NOTICE
Public Meeting Announcement
St. Luke's Magic Valley Hospital, Twin Falls, ID

An informational meeting will be held at the Land Group, Inc. located at 140 Riverviста Place in Twin Falls, Idaho from 4 to 5 PM on Monday May 14, 2007 in accordance with the Rules for the Control of Air Pollution in Idaho, Idaho Administrative Code, IDAPA 58.01.01.213.02 Permit to Construct Procedures For Pre-Permit Construction.

The purpose of the meeting is to inform the general public of St. Luke's new proposed hospital to be located in Twin Falls, Idaho. Additionally, this meeting will serve to fulfill the air quality pre-permit construction requirement per IDAPA 58.01.01.213.02.

The St. Luke's Twin Falls facility will be a full service hospital offering impatient and out- patient health care services for the Twin Fall area and outlying communities. There is no medical waste incinerator proposed for this facility.

PUBLISH: May 6, 2007

Appendix C
Emission Estimates

St. Luke's Magic Valley Medical Center

Table 1 - Potential to Emit Criteria Pollutant Summary

Modeling ID	Stationary Sources	Emission Rate (ton/year)						Emission Rate (lb/hr)					
		PM	PM-10	NOx	SO2	CO	VOC	PM	PM-10	NOx	SO2	CO	VOC
	Point Source												
HBOIL1	Hospital Heat Boilers (NG-16)	1.04	1.04	6.87	0.08	11.54	0.76	0.238	0.238	1.57	0.019	2.64	0.17
HBOIL1P	Hospital Backup Heat Boilers (Propane-16)	0.01	0.01	0.24	0.0003	0.03	0.01	0.14	0.14	4.90	0.02	0.66	0.17
SBOIL2	Hospital Steam Boilers (NG-4)	0.55	0.55	3.59	0.04	6.04	0.40	0.12	0.12	0.82	0.01	1.38	0.09
SBOIL2P	Hospital Backup Boiler (Propane-4)	3.53E-03	3.53E-03	0.12	1.76E-04	0.02	4.41E-03	0.07	0.07	2.57	3.67E-03	0.35	0.09
GEN1	300 kW Generator (1-Diesel)	0.01	0.01	1.02	0.23	0.06	0.01	0.03	0.03	4.07	0.92	0.25	0.06
GEN2	CAT 1500W Emergency Generators (4-Diesel)	0.08	0.08	11.59	3.57	1.58	0.28	0.80	0.80	115.92	35.69	15.80	2.84
WCT	Water Cooling Towers (2)	2.54	2.54	-	-	-	-	0.58	0.58	-	-	-	-
UST-12000	UST (12,000 Gal -Jet Fuel - 1 tank)						0.13						0.03
UST-15000	UST (15,000 Gal -Diesel -4 tanks)						4.20E-04						9.59E-05
	Total Stationary Sources	**4.2**	**4.2**	**23.4**	**3.93**	**19.3**	**1.59**	**1.99**	**1.99**	**129.84**	**36.67**	**21.07**	**3.46**
	Significant Emission Rates (10%)	**2.5**	**1.5**	**4.0**	**4.0**	**10.0**	**4.0**						
	Modeling Threshold	na	1.0	1.0	1.0	na	na	na	0.2	na	0.2	14.0	na
	Modeling Required		**Yes**	**Yes**	**Yes**				**Yes**		**Yes**	**Yes**	

Notes:
NG - Natural Gas
Numbers in stationary source column indicate number of like units.

St. Luke's Magic Valley Medical Center
Table 2 - Potential to Emit Toxic Pollutant Summary

Pollutant	Hospital Heat Boilers (16) (lb/hr)	Hospital Steam Boilers (4) (lb/hr)	300 kW Generator (lb/hr)	CAT 1500W Emergency Generators (4) (lb/hr)	12,000 Gallon UST (lb/hr)	15,000 Gallon UST (4) (lb/hr)	Total TAPS (lb/hr)	IDAPA 58.01.01.585/ 586 - EL (lb/hr)	PTE Emission Rate vs. EL
Ethylbenzene					2.47E-04		2.47E-04	2.90E+01	Below
2,2,4-Trimethylpentane					5.71E-06		5.71E-06	2.33E+01	Below
Cumene					8.33E-05		8.33E-05	1.63E+01	Below
Acrolein			1.68E-05	3.38E-05			5.05E-05	3.00E-03	Below
Acetaldehyde			1.39E-04	1.06E-05			1.50E-04	1.70E-02	Below
1,3-Butadiene			7.09E-06				7.09E-06	2.40E-05	**Below**
Xylenes			5.17E-05	2.59E-04	1.36E-03	4.57E-06	1.67E-03	2.90E+01	Below
3-Methylchloranthrene	5.65E-08	2.95E-08					8.60E-08	2.50E-06	Below
Benzene	6.59E-05	3.45E-05	1.69E-04	1.04E-03	5.71E-05	9.13E-06	**1.38E-03**	8.00E-04	**Exceeds**
Benzo(a)pyrene*	3.76E-08	1.97E-08	3.41E-08	3.44E-07			4.36E-07	2.00E+06	Below
Formaldehyde	2.35E-03	1.23E-03	2.14E-04	1.06E-04			**3.90E-03**	5.10E-04	**Exceeds**
Hexane	5.65E-02	2.95E-02			2.41E-04		8.62E-02	1.20E+01	Below
Naphthalene	1.91E-05	1.00E-05	1.54E-05	1.74E-04	1.08E-04		3.27E-04	3.33E+00	Below
Pentane	8.16E-02	4.27E-02					1.24E-01	1.18E+02	Below
Toluene	1.07E-04	5.58E-05	7.42E-05	3.77E-04	4.74E-04	4.57E-06	1.09E-03	2.50E+01	Below
POM[6]	3.58E-07	1.87E-07					5.45E-07	2.90E+01	Below
PAH			1.51E-05	1.10E-04			**1.25E-04**	9.10E-05	**Exceeds**
Arsenic	6.27E-06	3.28E-06					**9.56E-06**	1.50E-06	**Exceeds**
Barium	1.38E-04	7.22E-05					2.10E-04	3.30E-02	Below
Beryllium	3.76E-07	1.97E-07					5.73E-07	2.80E-05	Below
Cadmium	3.45E-05	1.80E-05					**5.26E-05**	3.70E-06	**Exceeds**
Chromium	4.39E-05	2.30E-05					6.69E-05	3.30E-02	Below
Cobalt	2.64E-06	1.38E-06					4.01E-06	3.30E-03	Below
Copper	2.67E-05	1.39E-05					4.06E-05	1.30E-02	Below
Manganese	1.19E-05	6.23E-06					1.82E-05	6.70E-02	Below
Mercury	8.16E-06	4.27E-06					1.24E-05	1.00E-03	Below
Molybdenum	3.45E-05	1.80E-05					5.26E-05	3.33E-01	Below
Nickel	6.59E-05	3.45E-05					**1.00E-04**	2.75E-05	**Exceeds**

St. Luke's Magic Valley Medical Center
Table 3 - Bldg Heat Boilers

Boiler (MMBtu/hr)*	2.0
Model No. 2000	Fulton Pulse
Fuel Type	Natural Gas
Maximum Operation Limit (hrs/yr)	8,760
Heat Value of Fuel (Btu/scf)	1,020

* Note:
There are 16 building heat boilers each rated at the same capacity and manifolded to one common stack. Therefore, emission calculations are presented for only one boiler.

		Uncontrolled Potential to Emit			
Criteria Pollutant[1]		Emission Factor (lb/10^6 scf)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)[2]		7.6	0.015	130.54	0.07
Nitrogen Oxides (NOx)		50.0	0.098	858.82	0.43
Sulfur Oxides (SOx)		0.6	0.001	10.31	0.01
Carbon Monoxide (CO)		84.0	0.165	1,442.82	0.72
VOC		5.5	0.011	94.47	0.05

		Uncontrolled Potential to Emit					
Toxic Air Pollutants[3]	CAS No.	Emission Factor (lb/10^6 scf)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
3-Methylchloranthrene	56-49-5	1.80E-06	3.53E-09	3.09E-05	1.55E-08	2.50E-06	Below
Benzene	71-43-2	2.10E-03	4.12E-06	3.61E-02	1.80E-05	8.00E-04	Below
Benzo(a)pyrene*	50-32-8	1.20E-06	2.35E-09	2.06E-05	1.03E-08	2.00E-06	Below
Formaldehyde	50-00-0	7.50E-02	1.47E-04	1.29E+00	6.44E-04	5.10E-04	Below
Hexane	110-54-3	1.80E+00	3.53E-03	3.09E+01	1.55E-02	1.20E+01	Below
Naphthalene	91-20-3	6.10E-04	1.20E-06	1.05E-02	5.24E-06	3.33E+00	Below
Pentane	109-66-0	2.60E+00	5.10E-03	4.47E+01	2.23E-02	1.18E+02	Below
Toluene	108-88-3	3.40E-03	6.67E-06	5.84E-02	2.92E-05	2.50E+01	Below
2-Methylnaphthalene	91-57-6	2.40E-05	4.71E-08	4.12E-04	2.06E-07		
7,12-Dimethylbenz(a)anthracene		1.60E-05	3.14E-08	2.75E-04	1.37E-07		
Acenaphthene	83-32-9	1.80E-06	3.53E-09	3.09E-05	1.55E-08		
Acenaphthylene	203-96-8	1.80E-06	3.53E-09	3.09E-05	1.55E-08		
Anthracene	120-12-7	2.40E-06	4.71E-09	4.12E-05	2.06E-08		
Benzo(a)anthracene*	56-55-3	1.80E-06	3.53E-09	3.09E-05	1.55E-08		
Benzo(b)fluoranthene*	205-82-3	1.80E-06	3.53E-09	3.09E-05	1.55E-08		
Benzo(g,h,I)perylene	191-24-2	1.20E-06	2.35E-09	2.06E-05	1.03E-08		
Benzo(k)fluoranthene*	205-82-3	1.80E-06	3.53E-09	3.09E-05	1.55E-08		
Chrysene*	218-01-9	1.80E-06	3.53E-09	3.09E-05	1.55E-08		
Dibenzo(a,h)anthracene*	53-70-3	1.20E-06	2.35E-09	2.06E-05	1.03E-08		
Dichlorobenzene	25321-22-6	1.20E-03	2.35E-06	2.06E-02	1.03E-05		
Fluoranthene	206-44-0	3.00E-06	5.88E-09	5.15E-05	2.58E-08		
Flourene	86-73-7	2.80E-06	5.49E-09	4.81E-05	2.40E-08		
Indeno(1,2,3-cd)pyrene*	193-39-5	1.80E-06	3.53E-09	3.09E-05	1.55E-08		
Phenanathrene	85-01-8	1.70E-05	3.33E-08	2.92E-04	1.46E-07		
Pyrene	129-00-0	5.00E-06	9.80E-09	8.59E-05	4.29E-08		
POM[4]			2.24E-08			2.00E-06	Below

		Uncontrolled Potential to Emit					
Toxic Air Pollutants-Metals[5]	CAS Number	Emission Factor (lb/10^6 scf)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Arsenic	7440-38-2	2.00E-04	3.92E-07	3.44E-03	1.72E-06	1.50E-06	Below
Barium	7440-39-3	4.40E-03	8.63E-06	7.56E-02	3.78E-05	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	2.35E-08	2.06E-04	1.03E-07	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	2.16E-06	1.89E-02	9.45E-06	3.70E-06	Below
Chromium	7440-47-3	1.40E-03	2.75E-06	2.40E-02	1.20E-05	3.30E-02	Below
Cobalt	7440-48-4	8.40E-05	1.65E-07	1.44E-03	7.21E-07	3.30E-03	Below
Copper	7440-50-8	8.50E-04	1.67E-06	1.46E-02	7.30E-06	1.30E-02	Below
Manganese	7439-96-5	3.80E-04	7.45E-07	6.53E-03	3.26E-06	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	5.10E-07	4.47E-03	2.23E-06	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	2.16E-06	1.89E-02	9.45E-06	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	4.12E-06	3.61E-02	1.80E-05	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	4.71E-08	4.12E-04	2.06E-07	1.30E-02	Below
Vanadium	1314-62-1	2.30E-03	4.51E-06	3.95E-02	1.98E-05	3.00E-03	Below
Zinc	7440-66-6	2.90E-02	5.69E-05	4.98E-01	2.49E-04	3.33E-01	Below

HAPs	0.016

Notes:

[1] Criteria Pollutants, small uncontrolled boilers (EPA AP-42, Section 1.4 Natural Gas Combustion, Tables 1.4-1 and 1.4-2).

[2] PM emission factor is assumed to equal PM_{10}.

[3] Toxic Air Pollutants (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-3).

[4] Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. Designated by *

[5] Metals from Natural Gas Combustion (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-4).

St. Luke's Magic Valley Medical Center
Table 4 - Backup Bldg Heat Boilers

Boiler (MMBtu/hr)*	**2.0**
Model No. 2000	**Fulton Pulse**
Fuel Type	**Propane**
Maximum Operation Limit (hrs/yr)	**96**
Heat Value of Fuel (MMBtu/10^3 gal)	**91.5**

* Note:
There are 16 building heat boilers each rated at the same capacity and manifolded to one common stack. Therefore, emission calculations are presented for only one boiler.

			Uncontrolled Potential to Emit		
Criteria Pollutant[1]		**Emission Factor (lb/10^3 gal)**	**Emission Rate (lb/hr)**	**Emission Rate (lb/yr)**	**Emission Rate (ton/yr)**
Total Particulate Matter (PM)[2]		0.4	0.009	0.84	4.20E-04
Nitrogen Oxides (NOx)		14.0	0.306	29.38	0.01
Sulfur Oxides (SOx)[3]		0.02	0.0004	0.04	2.10E-05
Carbon Monoxide (CO)		1.9	0.042	3.99	1.99E-03
TOC[4]		0.5	0.011	1.05	5.25E-04

Notes:

[1] Criteria Pollutants (EPA AP-42, Section 1.5 Liquefied Petroleum Gas Combustion, Table 1.5-1).

[2] PM emission factor is assumed to equal PM10.

[3] EPA AP-42, Table 1.5-1, Emission factor of 0.1S where S equal the sulfur content expressed in gr/100 ft^3 gas vapor. Assumed sulfur content of 0.2 gr/100 ft^3 (higher than literature value of 0.18); factor = .02 lb/10^3 gal propane burned.

[4] TOC emission factor is assumed to equal VOC.

St. Luke's Magic Valley Medical Center
Table 5 - Steam Boilers

Boiler (MMBtu/hr)*	4.2
4 VT Cyclone Series	Hurst
Fuel Type	Natural Gas
Maximum Operation Limit (hrs/yr)	8,760
Heat Value of Fuel (Btu/scf)	1,020

* Note:
There are 4 central plant steam boilers each rated at the same capacity and manifolded to one common stack
Therefore, emission calculations are presented for only one boiler.

			Uncontrolled Potential to Emit		
Criteria Pollutant[1]		Emission Factor (lb/10^6 scf)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)[2]		7.6	0.031	273.09	0.14
Nitrogen Oxides (NOx)		50.0	0.205	1,796.66	0.90
Sulfur Oxides (SOx)		0.6	0.002	21.56	0.01
Carbon Monoxide (CO)		84.0	0.345	3,018.39	1.51
VOC		5.5	0.023	197.63	0.10

			Uncontrolled Potential to Emit				
Toxic Air Pollutants[3]	CAS No.	Emission Factor (lb/10^6 scf)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
3-Methylchloranthrene	56-49-5	1.80E-06	7.38E-09	6.47E-05	3.23E-08	2.50E-06	Below
Benzene	71-43-2	2.10E-03	8.61E-06	7.55E-02	3.77E-05	8.00E-04	Below
Benzo(a)pyrene*	50-32-8	1.20E-06	4.92E-09	4.31E-05	2.16E-08	2.00E-06	Below
Formaldehyde	50-00-0	7.50E-02	3.08E-04	2.69E+00	1.35E-03	5.10E-04	Below
Hexane	110-54-3	1.80E+00	7.38E-03	6.47E+01	3.23E-02	1.20E+01	Below
Naphthalene	91-20-3	6.10E-04	2.50E-06	2.19E-02	1.10E-05	3.33E+00	Below
Pentane	109-66-0	2.60E+00	1.07E-02	9.34E+01	4.67E-02	1.18E+02	Below
Toluene	108-88-3	3.40E-03	1.39E-05	1.22E-01	6.11E-05	2.50E+01	Below
2-Methylnaphthalene	91-57-6	2.40E-05	9.84E-08	8.62E-04	4.31E-07		
7,12-Dimethylbenz(a)anthracene		1.60E-05	6.56E-08	5.75E-04	2.87E-07		
Acenaphthene	83-32-9	1.80E-06	7.38E-09	6.47E-05	3.23E-08		
Acenaphthylene	203-96-8	1.80E-06	7.38E-09	6.47E-05	3.23E-08		
Anthracene	120-12-7	2.40E-06	9.84E-09	8.62E-05	4.31E-08		
Benzo(a)anthracene*	56-55-3	1.80E-06	7.38E-09	6.47E-05	3.23E-08		
Benzo(b)fluoranthene*	205-82-3	1.80E-06	7.38E-09	6.47E-05	3.23E-08		
Benzo(g,h,I)perylene	191-24-2	1.20E-06	4.92E-09	4.31E-05	2.16E-08		
Benzo(k)fluoranthene*	205-82-3	1.80E-06	7.38E-09	6.47E-05	3.23E-08		
Chrysene*	218-01-9	1.80E-06	7.38E-09	6.47E-05	3.23E-08		
Dibenzo(a,h)anthracene*	53-70-3	1.20E-06	4.92E-09	4.31E-05	2.16E-08		
Dichlorobenzene	25321-22-6	1.20E-03	4.92E-06	4.31E-02	2.16E-05		
Fluoranthene	206-44-0	3.00E-06	1.23E-08	1.08E-04	5.39E-08		
Flourene	86-73-7	2.80E-06	1.15E-08	1.01E-04	5.03E-08		
Indeno(1,2,3-cd)pyrene*	193-39-5	1.80E-06	7.38E-09	6.47E-05	3.23E-08		
Phenanathrene	85-01-8	1.70E-05	6.97E-08	6.11E-04	3.05E-07		
Pyrene	129-00-0	5.00E-06	2.05E-08	1.80E-04	8.98E-08		
POM[4]			4.68E-08			2.00E-06	Below

			Uncontrolled Potential to Emit				
Toxic Air Pollutants-Metals[5]	CAS Number	Emission Factor (lb/10^6 scf)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Arsenic	7440-38-2	2.00E-04	8.20E-07	7.19E-03	3.59E-06	1.50E-06	Below
Barium	7440-39-3	4.40E-03	1.80E-05	1.58E-01	7.91E-05	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	4.92E-08	4.31E-04	2.16E-07	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	4.51E-06	3.95E-02	1.98E-05	3.70E-06	Exceeds
Chromium	7440-47-3	1.40E-03	5.74E-06	5.03E-02	2.52E-05	3.30E-02	Below
Cobalt	7440-48-4	8.40E-05	3.45E-07	3.02E-03	1.51E-06	3.30E-03	Below
Copper	7440-50-8	8.50E-04	3.49E-06	3.05E-02	1.53E-05	1.30E-02	Below
Manganese	7439-96-5	3.80E-04	1.56E-06	1.37E-02	6.83E-06	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	1.07E-06	9.34E-03	4.67E-06	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	4.51E-06	3.95E-02	1.98E-05	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	8.61E-06	7.55E-02	3.77E-05	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	9.84E-08	8.62E-04	4.31E-07	1.30E-02	Below
Vanadium	1314-62-1	2.30E-03	9.43E-06	8.26E-02	4.13E-05	3.00E-03	Below
Zinc	7440-66-6	2.90E-02	1.19E-04	1.04E+00	5.21E-04	3.33E-01	Below

HAPs	0.034

Notes:

[1] Criteria Pollutants, small uncontrolled boilers (EPA AP-42, Section 1.4 Natural Gas Combustion, Tables 1.4-1 and 1.4-2).

[2] PM emission factor is assumed to equal PM_{10}.

[3] Toxic Air Pollutants (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-3).

[4] Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. Designated by *

[5] Metals from Natural Gas Combustion (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-4).

St. Luke's Magic Valley Medical Center
Table 6 - Steam Boilers

Boiler (MMBtu/hr)*	**4.2**
4 VT Cyclone Series	**Hurst**
Fuel Type	**Propane**
Maximum Operation Limit (hrs/yr)	**96**
Heat Value of Fuel (MMBtu/10^3 gal)	**91.5**

* Note:
There are 4 central plant steam boilers each rated at the same capacity and manifolded to one common stack. Therefore, emission calculations are presented for only one boiler.

			Uncontrolled Potential to Emit		
Criteria Pollutant[1]		**Emission Factor ($lb/10^3$ gal)**	**Emission Rate (lb/hr)**	**Emission Rate (lb/yr)**	**Emission Rate (ton/yr)**
Total Particulate Matter (PM)[2]		0.4	0.01836	1.76	8.81E-04
Nitrogen Oxides (NOx)		14.0	0.64262	61.69	3.08E-02
Sulfur Oxides (SOx)[3]		0.02	0.00092	0.09	4.41E-05
Carbon Monoxide (CO)		1.9	0.08721	8.37	4.19E-03
TOC[4]		0.5	0.02295	2.20	1.10E-03

Notes:
[1] Criteria Pollutants (EPA AP-42, Section 1.5 Liquefied Petroleum Gas Combustion, Table 1.5-1).
[2] PM emission factor is assumed to equal PM10.
[3] EPA AP-42, Table 1.5-1, Emission factor of 0.1S where S equal the sulfur content expressed in gr/100 ft^3 gas vapor. Assumed sulfur content of 0.2 gr/100 ft^3 (higher than literature value of 0.18); factor = .02 $lb/10^3$ gal propane burned.
[4] TOC emission factor is assumed to equal VOC.

St. Luke's Magic Valley Medical Center
Table 7 - Emergency Standby Generator

Generator Name	**300 KW**
Model No.	
Brake Horsepower Rating (hp)	449
Fuel Type	Distillate #2
- maximum sulfur content	0.50%
Maximum Firing Rate (gals/hr)	22.7
Maximum Heat Input Rating (Btu/hr)	3,178,000
Maximum Hours of Operation	500
Maximum Firing Rate (gals/yr)	11,350
Annual Operation Limit (hrs/yr)	500
Annual Firing Rate (gals/yr)	11,350
Heat Value of Fuel (Btu/gal)	140,000

			Uncontrolled Potential to Emit			
Criteria Pollutant	**CAS No.**	**Emission Factor[1] (lb/MMBtu)**	**Emission Factor[2] (g/hp-hr)**	**Emission Rate (lb/hr)**	**Emission Rate (lb/yr)**	**Emission Rate (ton/yr)**
Total Particulate Matter (PM)[3]			0.033	0.03	16	0.01
Nitrogen Oxides (NOx)			4.11	4.07	2,034	1.02
Sulfur Oxides		0.290		0.92	461	0.23
Carbon Monoxide (CO)			0.25	0.25	124	0.06
HC[4]			0.06	0.06	30	0.01

				Uncontrolled Potential to Emit				
Compound	**CAS Number**		**Emission Factor[5] (lb/MMBtu)**	**Emission Rate (lb/hr)**	**Emission Rate (lb/yr)**	**Emission Rate (ton/yr)**	**IDAPA 58.01.01.585/586 - EL (lb/hr)**	**PTE Emission Rate vs. EL**
1,3-Butadiene	106-99-0		3.91E-05	1.24E-04	6.21E-02	3.11E-05	2.40E-05	**Exceeds**
Acetaldehyde	75-07-0		7.67E-04	2.44E-03	1.22E+00	6.09E-04	3.00E-03	Below
Acrolein	107-02-8		9.25E-05	2.94E-04	1.47E-01	7.35E-05	1.70E-02	Below
Benzene	71-43-2		9.33E-04	2.97E-03	1.48E+00	7.41E-04	8.00E-04	**Exceeds**
Benzo(a)pyrene*	50-32-8		1.88E-07	5.97E-07	2.99E-04	1.49E-07	2.00E+06	Below
Formaldehyde	50-00-0		1.18E-03	3.75E-03	1.88E+00	9.38E-04	5.10E-04	**Exceeds**
Naphthalene	91-20-3		8.48E-05	2.69E-04	1.35E-01	6.74E-05	3.33E+00	Below
Propylene			2.58E-03	8.20E-03	4.10E+00	2.05E-03		
Toluene	108-88-3		4.09E-04	1.30E-03	6.50E-01	3.25E-04	2.50E+01	Below
Xylenes	1330-20-7		2.85E-04	9.06E-04	4.53E-01	2.26E-04	2.90E+01	Below
Total PAH[6]			8.30E-05	2.64E-04	1.32E-01	6.60E-05	9.10E-05	**Exceeds**
HAPs						**0.004**		

Notes:

[1] Emission factor for SO_2 was utilized from EPA AP-42, Section 3.3 Gasoline and Diesel Industrial Engines,Table 3.3-1.

[2] Generator emission rates were supplied by Western States CAT and utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).

[3] PM emission factor is assumed to equal PM_{10}.

[4] HC is assumed to equal VOC.

[5] Toxic emission factors were utilized from EPA AP-42, Section 3.3 Gasoline and Diesel Industrial Engines,Table 3.3-2.

[6] Based on removing benzo(a)pyrene and naphthalene from Total PAH, EPA AP-42, Section 3.3 Gasoline and Diesel Industrial Engines,Table 3.3-2.

St. Luke's Magic Valley Medical Center
Table 8 - Emergency Standby Generator

Generator Name	1500 KW
Model No.	3512C
Brake Horsepower Rating (hp)	2,206
Fuel Type	Distillate #2
- maximum sulfur content	0.50%
Maximum Firing Rate (gals/hr)	104.8
Maximum Heat Input Rating (Btu/hr)	14,672,000
Maximum Hours of Operation	200
Maximum Firing Rate (gals/yr)	20,960
Annual Operation Limit (hrs/yr)	200
Annual Firing Rate (gals/yr)	20,960
Heat Value of Fuel (Btu/gal)	140,000

There are 4-1500 KW emergency generators each rated at the same capacity and stack parameters with 4 separate exit stacks.
Emission calculations are presented for only one generator.

			Uncontrolled Potential to Emit		
Criteria Pollutant	**CAS No.**	**Emission Factor[1] (lb/hp-hr)**	**Emission Rate[2] (lb/hr)**	**Emission Rate (lb/yr)**	**Emission Rate (ton/yr)**
Total Particulate Matter (PM)[3]			0.20	40	0.02
Nitrogen Oxides (NOx)			28.98	5,796	2.90
Sulfur Oxides		0.004	8.92	1,785	0.89
Carbon Monoxide (CO)			3.95	790	0.40
HC[4]			0.71	142	0.07

			Uncontrolled Potential to Emit					
Compound	**CAS Number**		**Emission Factor[5] (lb/MMBtu)**	**Emission Rate (lb/hr)**	**Emission Rate (lb/yr)**	**Emission Rate (ton/yr)**	**IDAPA 58.01.01.5 85/586 - EL (lb/hr)**	**PTE Emission Rate vs. EL**
Acetaldehyde	75-07-0		2.52E-05	3.70E-04	7.39E-02	3.70E-05	3.00E-03	Below
Acrolein	107-02-8		7.88E-06	1.16E-04	2.31E-02	1.16E-05	1.70E-02	Below
Benzene	71-43-2		7.76E-04	1.14E-02	2.28E+00	1.14E-03	8.00E-04	Exceeds
Benzo(a)pyrene*	50-32-8		2.57E-07	3.77E-06	7.54E-04	3.77E-07	2.00E+06	Below
Formaldehyde	50-00-0		7.89E-05	1.16E-03	2.32E-01	1.16E-04	5.10E-04	Exceeds
Naphthalene	91-20-3		1.30E-04	1.91E-03	3.81E-01	1.91E-04	3.33E+00	Below
Toluene	108-88-3		2.81E-04	4.12E-03	8.25E-01	4.12E-04	2.50E+01	Below
Xylenes	1330-20-7		1.93E-04	2.83E-03	5.66E-01	2.83E-04	2.90E+01	Below
Total PAH[6]			8.17E-05	1.20E-03	2.40E-01	1.20E-04	9.10E-05	Exceeds
HAPs						**0.002**		

Notes:

[1] Emission factor for SO_2 was utilized from EPA AP-42, Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines,Table 3.4-1

[2] Generator emission rates were supplied by Western States CAT and utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).

[3] PM emission factor is assumed to equal PM_{10}.

[4] HC is assumed to equal VOC.

[5] Toxic emission factors were utilized from EPA AP-42, Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines,Tables 3.4-3 and 3.4-4.

[6] Based on removing benzo(a)pyrene and naphthalene from Total PAH, EPA AP-42, Section 3.4 Large Stationary Diesel and All Stationary Dual Fuel Engines, Tables 3.4-3 and 3.4-4.

St. Luke's Magic Valley Medical Center

Chiller Upgrade Project -- Cooling Tower

Design Specifications			
Circulating flowrate:	5,000	gal/min	Per Cooling Tower
Design TDS	580	ppm	Twin Falls TDS

Calculated Emission Rate - Based on Design Specifications & AP-42 Drift Factor

Unit	One Cooling Tower		Two Cooling Towers		Notes
Est. Drift Factor @0.02%	1.00	gal/min	1	gal/min	Uses AP-42 drift factor
TDS	580	ppm	580	ppm	Uses design TDS
Calculated emission rate	0.29	lb PM_{10}/hr	0.58	lb PM_{10}/hr	
Annual Emissions:	2,544	lb PM_{10}	**5,088**	lb PM_{10}	
	1.27	ton PM_{10}	**2.54**	ton PM_{10}	

St Lukes Magic Valley Medical Center

Table 6 - 15,000 Gallon UST

Tank Dimensions				
Length (ft)	Diameter (ft)	Capacity (gal)	Throughput (No/yr)	VOC emissions (lb/yr))[1]
18	12	15000	1	0.21

Emission Type	CAS No	Emission Estimate[2] (lb/yr)	Emission Estimate[3] (lb/hr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Ethylbenzene	100-41-4	0.00	0.0E+00	29.0	Below
Toluene	108-88-3	0.01	1.1E-06	25.0	Below
2,2,4-Trimethylpen	540-87-1	0.00	0.0E+00	23.3	Below
Benzene	71-43-2	0.02	2.3E-06	8.0E-04	Below
Cumene	98-82-8	0.00	0.0E+00	16.3	Below
Xylene (mixed)	1330-20-7	0.01	1.1E-06	29.0	Below

[1] Volatile Speciation for Dieseel based on USAF Institute for Environment, Safety, and Occupational Risk Analysis,

[2] Emission estimate based on EPA Tanks Program Version 4.0.9d -see attached

[3] UST pound per hour emissions based on 8, 760 hours per year

St. Luke's Magic Valley Medical Center
PM Standard Calculations

Compliance with IDAPA Rule 677 PM Standard for Fuel Burning Equipment

Unit	1500 kW-Generator
Fuel	No. 2 Diesel Fuel
Rated Heat Input (MM Btu/hr)	14.67
PM Emission Rate (lb/hr)	0.80
Exit/Flue Gas Flowrate Calculation	
F_d (Table 19-2, EPA Method 19) (dscf/MM Btu) [1,2]	9,190
Exit flowrate @ 0% O_2: (acfm)	5,908
Exit flowrate @ 0% O_2: (dscfm)[5]	2,734
Exit flowrate @ 3% O_2 for Natural Gas: (dscfm) [3]	3,192
Calculated Grain Loading (gr/dscf @ 3% O_2) [4]	0.029
PM Loading Standard (IDAPA 58.01.01.677) (gr/dscf @ 3% 02)	0.050
Compliance w/ PM Loading Standard	Yes

[1] Appendix A-7 to 40 CFR part 60, Method 19—Determination of sulfur dioxide removal efficiency and particulate, sulfur dioxide and nitrogen oxides emission

[2] Fd, Volumes of combustion components per unit of heat content (scf/million Btu). Fd for No. 2 diesel fuel is 9,190 dscf/106 Btu.

[3] (Flow $_{3\%}$) = (Flow $_{0\%}$)x (20.9/(20.9 - 3)), where 20.9 = Oxygen concentration in ambient air

[4] (Flow (dscfm) x (7,000 gr/lb) x (PM lb/hr) x (60 min/ hr) = gr/dscf

Appendix D
Manufacturer Data

FanCalc 2005

EXHAUSTO
VENTING DESIGN SOLUTIONS

EXHAUSTO Job # : F-22361
Job/Project Name : St Lukes Twins Falls
City/State : Twin Falls, ID

Prepared for : Bill Hill
Company : Midgley-Huber, Inc.
City/State : Boise, ID

Prepared by : Karl R. Coleman
E-mail : karlc@exhausto.com
Phone Ext. : 2514

System Data:

System Type : VENT
Description : 16 Appliances

Location Data:

Local Altitude : 3720 ft A.S.L.
Barometric Pressure : 26.10 in. Hg
Ambient Temperature : 60 °F

Equipment Data:

Appl. No.	Manufacturer	Model	Category	Fuel	Input MBH	CO2%	Temp. Rise, °F	Baro. Damper	Draft Reqd.
1	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
2	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
3	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
4	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
5	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
6	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
7	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
8	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
9	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
10	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
11	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
12	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
13	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
14	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
15	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4
16	Fulton	PHW2000	IV	Natural Gas	2000	8.50	180	NO	0.2 to 0.4

Vent System - Mechanical:

Section No.	Model	Size in.	Vert. ft	Hori. ft	Flow lb/h	Velocity FPM	Temp. °F	Dt in.W.C.	Delta P in.W.C.	K-Value	Fitting(s)
1	AL29-4C	28ø	12	-	32032	2462	222	0.037	0.027	0.107	None
2	AL29-4C	28ø	-	10	32032	2469	224	0.000	0.100	0.389	90°L
3	AL29-4C	28ø	-	5	30030	2318	225	0.000	0.010	0.045	BootT
4	AL29-4C	28ø	-	5	28028	2164	225	0.000	0.009	0.045	BootT
5	AL29-4C	28ø	-	5	26026	2009	225	0.000	0.008	0.045	BootT
6	AL29-4C	28ø	-	5	24024	1852	224	0.000	0.006	0.045	BootT
7	AL29-4C	28ø	-	5	22022	1698	224	0.000	0.005	0.045	BootT
8	AL29-4C	28ø	-	5	20020	1543	224	0.000	0.004	0.045	BootT
9	AL29-4C	28ø	-	5	18018	1389	224	0.000	0.004	0.045	BootT
10	AL29-4C	28ø	-	5	16016	1235	224	0.000	0.003	0.045	BootT
11	AL29-4C	28ø	-	5	14014	1080	224	0.000	0.002	0.045	BootT
12	AL29-4C	28ø	-	5	12012	927	225	0.000	0.002	0.045	BootT
13	AL29-4C	28ø	-	5	10010	774	226	0.000	0.001	0.045	BootT
14	AL29-4C	28ø	-	5	8008	620	227	0.000	0.001	0.045	BootT
15	AL29-4C	28ø	-	5	6006	466	228	0.000	0.000	0.045	BootT
16	AL29-4C	28ø	-	5	4004	310	228	0.000	0.000	0.045	BootT
17	AL29-4C	28ø	-	5	2002	156	230	0.000	0.000	0.045	BootT

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Vent System - Mechanical:

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18	AL29-4C	6ø	5	-	2002	3405	233	0.016	0.244	0.508	90°L
19	AL29-4C	6ø	-	8	2002	3426	237	0.000	0.306	0.633	90°L
20	AL29-4C	6ø	5	-	2002	3405	233	0.016	0.340	0.708	BootT
21	AL29-4C	6ø	-	8	2002	3426	237	0.000	0.306	0.633	90°L
22	AL29-4C	6ø	5	-	2002	3405	233	0.016	0.340	0.708	BootT
23	AL29-4C	6ø	-	8	2002	3426	237	0.000	0.306	0.633	90°L
24	AL29-4C	6ø	5	-	2002	3405	233	0.016	0.340	0.708	BootT
25	AL29-4C	6ø	-	8	2002	3426	237	0.000	0.306	0.633	90°L
26	AL29-4C	6ø	5	-	2002	3405	233	0.016	0.340	0.708	BootT
27	AL29-4C	6ø	-	8	2002	3426	237	0.000	0.306	0.633	90°L
28	AL29-4C	6ø	5	-	2002	3405	233	0.016	0.340	0.708	BootT
29	AL29-4C	6ø	-	8	2002	3426	237	0.000	0.306	0.633	90°L
30	AL29-4C	6ø	5	-	2002	3405	233	0.016	0.340	0.708	BootT
31	AL29-4C	6ø	-	8	2002	3426	237	0.000	0.306	0.633	90°L
32	AL29-4C	6ø	5	-	2002	3405	233	0.016	0.340	0.708	BootT
33	AL29-4C	6ø	-	8	2002	3426	237	0.000	0.306	0.633	90°L
34	AL29-4C	6ø	-	5	2002	3405	233	0.000	0.340	0.708	BootT
35	AL29-4C	6ø	8	-	2002	3426	237	0.026	0.306	0.633	90°L
36	AL29-4C	6ø	-	5	2002	3405	233	0.000	0.340	0.708	BootT
37	AL29-4C	6ø	8	-	2002	3426	237	0.026	0.306	0.633	90°L
38	AL29-4C	6ø	-	5	2002	3405	233	0.000	0.340	0.708	BootT
39	AL29-4C	6ø	8	-	2002	3426	237	0.026	0.306	0.633	90°L
40	AL29-4C	6ø	-	5	2002	3405	233	0.000	0.340	0.708	BootT
41	AL29-4C	6ø	8	-	2002	3426	237	0.026	0.306	0.633	90°L
42	AL29-4C	6ø	-	5	2002	3405	233	0.000	0.340	0.708	BootT
43	AL29-4C	6ø	8	-	2002	3426	237	0.026	0.306	0.633	90°L
44	AL29-4C	6ø	-	5	2002	3405	233	0.000	0.340	0.708	BootT
45	AL29-4C	6ø	8	-	2002	3426	237	0.026	0.306	0.633	90°L
46	AL29-4C	6ø	-	5	2002	3405	233	0.000	0.340	0.708	BootT
47	AL29-4C	6ø	8	-	2002	3426	237	0.026	0.306	0.633	90°L
48	AL29-4C	6ø	-	5	2002	3405	233	0.000	0.340	0.708	BootT
49	AL29-4C	6ø	8	-	2002	3426	237	0.026	0.306	0.633	90°L

Results - Mechanical (System ON):

Appliance ON (Input)	MBH Input	Massflow (Lbs/hr)	Draft (9°F)	Draft (60°F)	Draft (94°F)	Temp. (°F)	Min. Vel. FPM	Max. Vel. FPM
ALL (FULL)	32000	32032	-0.020	-0.020	-0.020	221	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	30400	30430	-0.020	-0.020	-0.020	220	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	30000	30070	-0.020	-0.020	-0.020	220	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	28400	28468	-0.020	-0.020	-0.020	219	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	28000	28108	-0.020	-0.020	-0.020	219	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	26400	26506	-0.020	-0.020	-0.020	218	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	26000	26146	-0.020	-0.020	-0.020	218	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	24400	24544	-0.020	-0.020	-0.020	217	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	24000	24184	-0.020	-0.020	-0.020	217	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	22400	22582	-0.020	-0.020	-0.020	216	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	22000	22222	-0.020	-0.020	-0.020	216	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	20400	20620	-0.020	-0.020	-0.020	214	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	20000	20260	-0.020	-0.020	-0.020	214	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	18400	18658	-0.020	-0.020	-0.020	213	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	18000	18298	-0.020	-0.020	-0.020	213	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	16400	16696	-0.020	-0.020	-0.020	211	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	16000	16336	-0.020	-0.020	-0.020	211	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	14400	14734	-0.020	-0.020	-0.020	210	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	14000	14374	-0.020	-0.020	-0.020	210	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	12400	12772	-0.020	-0.020	-0.020	203	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	12000	12412	-0.020	-0.020	-0.020	202	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	10400	10810	-0.020	-0.020	-0.020	198	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	10000	10450	-0.020	-0.020	-0.020	198	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%), 5..	8400	8848	-0.020	-0.020	-0.020	195	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (100%)	8000	8488	-0.020	-0.020	-0.020	196	156	3426
1 (100%), 2 (100%), 3 (100%), 4 (20%)	6400	6886	-0.020	-0.020	-0.020	192	156	3426
1 (100%), 2 (100%), 3 (100%)	6000	6526	-0.020	-0.020	-0.020	191	156	3426
1 (100%), 2 (100%), 3 (20%)	4400	4924	-0.020	-0.020	-0.020	181	156	3426
1 (100%), 2 (100%)	4000	4564	-0.020	-0.020	-0.020	179	156	3426

..Continued on page 3

Results - Mechanical (System ON):

..Continued from page 2

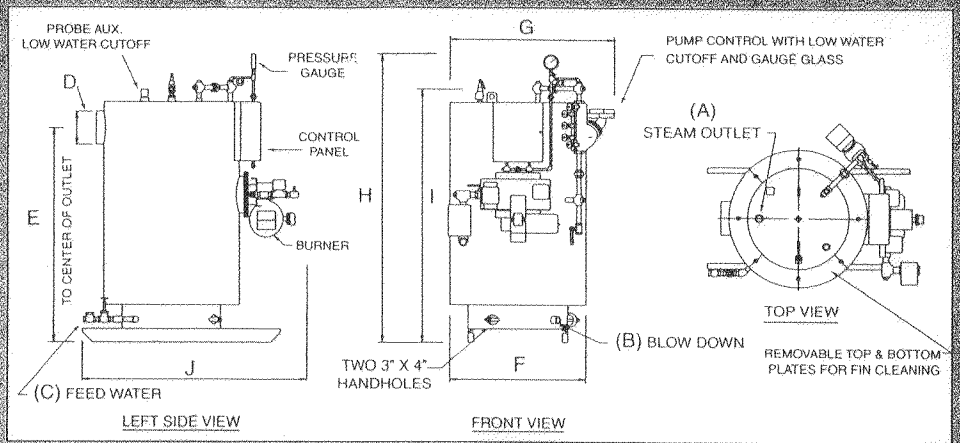
1 (100%), 2 (20%)	2400	2962	-0.049	-0.036	-0.024	164	156	3426
1 (100%)	2000	2602	-0.049	-0.036	-0.024	162	156	3426
1 (20%)	400	1000	-0.045	-0.032	-0.020	135	30	679

Volumetric Flow : 10528 CFM Max. Inlet Pressure : 0.623 in. W.C.

Venting Solution:

RSV450-4

4VT CYCLONE SERIES



STANDARD STEAM TRIM

Steam pressuretrol with syphon and test cock.

McDonnell & Miller #157 combination low water cutoff and pump control units with column blowdown valve.

McDonnell & Miller probe auxiliary low water cutoff and relay.

ASME safety relief valve.

Operating and modulating pressure controls.

Steam outlet valve, slow opening blow down valve, feedwater shut off valve, and check valves included on boilers through 100 HP.

150# STEAM 4VT CYCLONE SERIES SPECIFICATIONS

	BOILER HORSEPOWER		6	10	15	20	25	30	40	50	60	70	80	100	
	STEAM OUTPUT FROM & AT 212° F	LBS./HR.	207	345	518	690	863	1035	1380	1725	2070	2415	2760	3450	
		KG./HR.	94	156	235	313	391	469	626	782	939	1095	1252	1565	
	GROSS OUTPUT	(MBH), BTU X 1000	201	335	502	670	837	1004	1339	1674	2009	2343	2678	3348	
		KCAL X 1000	51	84	127	169	211	253	337	422	506	590	675	844	
	INPUT REQUIRED	BTU X 1000	251	418	628	837	1046	1255	1674	2092	2511	2929	3348	4184	
		KCAL X 1000	63.3	105	158	211	264	316	422	527	633	738	844	1054	
	FIRING RATE NAT. GAS 1000 BTU/FT3	FT 3/HR.	251	418	628	837	1046	1255	1674	2092	2511	2929	3348	4184	
		M 3/HR.	7.1	11.8	17.8	23.7	29.6	35.5	47.4	59.2	71.1	82.9	94.8	118.5	
	FIRING RATE LP. GAS 91,500 BTU/GAL.	GPH	2.7	4.6	6.9	9.1	11.4	13.7	18.3	22.9	27.4	32	36.6	45.7	
		LPH	10.4	17.3	26	34.6	43.3	51.9	69.2	86.6	103.9	121.2	138.5	173.1	
	FIRING RATE #2 OIL 140,000 BTU/GAL.	GPH	1.8	3	4.5	6	7.5	9	12	14.9	17.9	20.9	23.9	29.9	
		LPH	6.8	11.3	17	22.6	28.3	33.9	45.3	56.6	67.9	79.2	90.5	113.1	
A	STEAM OUTLET *HIGH PRESS.*	IN.	1	1	1	1	1.25	1.5	2	2.5	2.5	2.5	2.5	3	A
		MM	25	25	25	25	32	38	51	64	64	64	64	76	
A	STEAM OUTLET *LOW PRESS.*	IN.	2	2	2	3	3	4	4	6	6	6	6	6	A
		MM	51	51	51	76	76	102	102	152	152	152	152	152	
B	BLOWDOWN *HIGH PRESS.*	IN.	1	1	1	1	1	1.25	1.25	1.25	1.25	1.25	1.25	1.25	B
		MM	25	25	25	25	25	32	32	32	32	32	32	32	
B	BLOWDOWN *LOW PRESS.*	IN.	1	1	1	1	1	1.25	1.25	1.25	1.25	1.5	1.5	1.5	B
		MM	25	25	25	25	25	32	32	32	32	38	38	38	
C	FEEDWATER	IN.	.75	.75	.75	.75	.75	1	1	1	1	1	1	1.25	C
		MM	19	19	19	19	19	25	25	25	25	25	25	32	
D	STACK DIA.	IN.	8	8	8	8	8	10	12	12	12	14	14	14	D
		MM	203	203	203	203	203	254	305	305	305	356	356	356	
E	STACK HEIGHT	IN.	52	52	58	64	64	63	73	83	83	82	82	82	E
		MM	1321	1321	1473	1626	1626	1600	1854	2108	2108	2083	2083	2083	
F	WIDTH WITHOUT TRIM	IN.	35.2	35.2	35.2	35.2	35.2	41	50	59	59	68	68	78.2	F
		MM	894	894	894	894	894	1041	1270	1499	1499	1727	1727	1986	
G	WIDTH WITH TRIM	IN.	42	42	42	42	42	47	55	63	63	72	72	82	G
		MM	1067	1067	1067	1067	1067	1194	1397	1600	1600	1829	1829	2083	
H	OVERALL HEIGHT	IN.	79	79	85	85	85	85	93	105	105	106	106	106	H
		MM	2007	2007	2159	2159	2159	2159	2362	2667	2667	2692	2692	2692	
I	HEIGHT WITHOUT TRIM	IN.	65	65	71	77	77	77	88	98	98	98	98	98	I
		MM	1651	1651	1803	1956	1956	1956	2235	2489	2489	2489	2489	2489	
J	LENGTH	IN.	60	60	60	60	60	78	87	115	115	120	120	127	J
		MM	1524	1524	1524	1524	1524	1981	2210	2921	2921	3048	3048	3226	
	WATER CAP. @ NWL	GALS.	48	48	54	54	54	73	122	158	158	196	196	290	
		LITERS	182	182	204	204	204	276	462	598	598	742	742	1098	
	WATER CAP. FLOODED	GALS.	62	62	68	79	79	113	208	313	313	440	440	591	
		LITERS	235	235	257	299	299	428	787	1185	1185	1665	1665	2237	
	SHIPPING WEIGHT	LBS.	1700	1700	1850	1900	1900	2300	3900	5500	5500	7600	7600	9100	
		KG.	771	771	839	862	862	1043	1769	2495	2495	3347	3347	4128	
	BOILER HORSEPOWER		6	10	15	20	25	30	40	50	60	70	80	100	

Available with design pressures to 300 PSIG. Outlet connections over four inches on low pressure models are 150# flanges. All other connections are NPT. We assume no responsibility for errors in data. Consult factory for certified drawings.

rosehboiler.com

P. O. Drawer 529
21971 US. Highway 319 N.
Coolidge, Georgia 31738
1-877-994-8778 (Toll Free)
(229) 346-3545 (Tel.)
(229) 346-3874 (Fax.)
e-mail: hboiler@rose.net

Represented by:

Revised 09/00-BPC

EXHAUSTO
VENTING DESIGN SOLUTIONS

4 Hurst Steam Boilers

Vent System - Mechanical:

Section No.	Model	Size in	Vert. ft	Hori. ft	Flow lb/h	Velocity FPM	Temp. °F	Dt in.W.C.	Delta P in.W.C.	K-Value	Fitting(s)
1	Pressure Stack	20ø	12	-	12567	2393	402	0.061	0.034	0.180	None
2	Pressure Stack	20ø	-	10	12567	2401	405	0.000	0.086	0.450	90°L
3	Pressure Stack	20ø	-	10	8378	1606	408	0.000	0.013	0.150	45°T
4	Pressure Stack	20ø	-	10	4189	807	412	0.000	0.003	0.150	45°T
5	Pressure Stack	14ø	5	-	4189	1658	418	0.026	0.082	0.907	90°L
6	Pressure Stack	14ø	-	5	4189	1651	414	0.000	0.045	0.507	45°T
7	Pressure Stack	14ø	5	-	4189	1658	418	0.026	0.082	0.907	90°L
8	Pressure Stack	14ø	-	5	4189	1651	414	0.000	0.045	0.507	45°T
9	Pressure Stack	14ø	5	-	4189	1658	418	0.026	0.082	0.907	90°L

Results - Mechanical (System ON):

Appliance ON (Input)	MBH Input	Massflow (Lbs/hr)	Draft (9°F)	Draft (60°F)	Draft (94°F)	Temp. (°F)	Min. Vel. FPM	Max. Vel. FPM
ALL (FULL)	12552	12567	-0.020	-0.020	-0.020	400	807	2401
1 (100%), 2 (100%), 3 (10%)	8786	8797	-0.020	-0.020	-0.020	393	161	1675
1 (100%), 2 (100%)	8368	8420	-0.020	-0.020	-0.020	394	807	1658
1 (100%), 2 (10%)	4602	4650	-0.020	-0.020	-0.020	380	161	1658
1 (100%)	4184	4273	-0.020	-0.020	-0.020	380	798	1658
1 (10%)	418	503	-0.091	-0.075	-0.063	295	78	164

Volumetric Flow : 5221 CFM

Max. Inlet Pressure : 0.303 in. W.C.

Venting Solution:

RSV450-2

EXHAUSTO Inc.
1200 Northmeadow Pkwy.
Suite 180
Roswell, GA 30076

P: 770.587.3238
F: 770.587.4731
T: 800.255.2923

info@exhausto.com
us.exhausto.com

GEN SET PACKAGE PERFORMANCE DATA

JANUARY 19, 2007

For Help Desk Phone Numbers Click here

Performance Number: DM8260

Change Level: 01

Sales Model: 3512CDITA **Combustion:** DI **Aspr:** TA

Engine Power:
1500 W/F EKW 1560 W/O F EKW **Speed:** 1,800 RPM **After Cooler:** ATAAC
2,206 HP

Manifold Type: DRY **Governor Type:** ADEM3 **After Cooler Temp(F):** 122

Turbo Quantity: 4 **Engine App:** GP **Turbo Arrangement:** Parallel

Hertz: 60 **Engine Rating:** PGS **Strategy:**

Rating Type: STANDBY **Certification:** EPA TIER-2 2006 -

General Performance Data 1

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL RATE LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
1,500.0	100	2206	307	0.333	104.8	121.6	78.0	4,573.3	1,150.7	763.5	11,060.6
1,350.0	90	1983	276	0.337	95.3	116.4	72.6	4,382.6	1,105.7	728.6	10,294.2
1,200.0	80	1768	246	0.343	86.7	113.5	67.4	4,184.8	1,071.9	710.1	9,655.0
1,125.0	75	1662	231	0.346	82.1	111.9	64.0	4,050.6	1,054.9	701.8	9,277.2
1,050.0	70	1556	217	0.349	77.5	110.5	60.2	3,898.7	1,037.7	694.4	8,867.5
900.0	60	1349	188	0.353	67.9	107.4	51.6	3,542.1	1,002.4	683.1	7,970.5
750.0	50	1144	159	0.355	58.1	107.6	41.1	3,083.0	965.3	682.5	6,935.8
600.0	40	943	131	0.359	48.3	108.3	30.6	2,627.4	923.9	683.4	5,908.1
450.0	30	737	103	0.367	38.6	107.2	21.1	2,203.6	858.6	668.7	4,894.6
375.0	25	632	88	0.375	33.9	106.3	17.1	2,016.5	811.6	649.0	4,407.3
300.0	20	526	73	0.387	29.1	105.3	13.4	1,847.0	755.8	621.9	3,930.5
150.0	10	310	43	0.442	19.6	103.3	7.3	1,578.6	609.8	526.5	3,040.6

General Performance Data 2

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	COMPRESS OUT PRESS KPA	COMPRESS OUT TEMP DEG F
1,500.0	100	2206	183	452.1
1,350.0	90	1983	164	430.3
1,200.0	80	1768	146	410.4
1,125.0	75	1662	134	398.1
1,050.0	70	1556	120	384.1
900.0	60	1349	90	351.7
750.0	50	1144	52	309.4
600.0	40	943	15	267.1
450.0	30	737	19	224.6
375.0	25	632	33	203.9
300.0	20	526	46	183.7
150.0	10	310	68	148.3

Performance Data

RATED SPEED "Not to exceed data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,500.0	100	2206	28.9800	3.9500	.7100	.2000	10.2000	.8000	1.2800
1,125.0	75	1662	14.7100	2.4400	.7800	.2000	11.5000	.9000	1.2800
750.0	50	1144	9.6800	3.3200	.7400	.3000	12.2000	1.9000	1.2800
375.0	25	632	7.2600	4.0700	.5800	.3800	13.2000	3.3000	1.2800
150.0	10	310	5.6300	3.8300	.6700	.2300	15.2000	2.0000	1.2800

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	TOTAL CO2 LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,500.0	100	2206	24.1500	2.1900	.5300	2,262.3	.1400	10.2000	.8000	1.2800
1,125.0	75	1662	12.2600	1.3600	.5900	1,764.4	.1400	11.5000	.9000	1.2800
750.0	50	1144	8.0700	1.8400	.5500	1,242.0	.2100	12.2000	1.9000	1.2800
375.0	25	632	6.0500	2.2600	.4400	720.0	.2700	13.2000	3.3000	1.2800
150.0	10	310	4.6900	2.1300	.5000	410.8	.1600	15.2000	2.0000	1.2800

GEN SET PACKAGE PERFORMANCE DATA [1DZ11537]

APRIL 04, 2007

(1DZ11537)-ENGINE (G5A00516)-GENERATOR (C5G00857)-GENSET

For Help Desk Phone Numbers Click here

Performance Number: DM2267 **Change Level:** 02

Sales Model: 3406CDITA **Combustion:** DI **Aspr:** TA

Engine Power:
300 W/F EKW 311 W/O F EKW
449 HP **Speed:** 1,800 RPM **After Cooler:** JWAC

Manifold Type: DRY **Governor Type:** HYDRA **After Cooler Temp(F):** –

Turbo Quantity: 1 **Engine App:** GP **Turbo Arrangement:**

Hertz: 60 **Engine Rating:** PGS **Strategy:**

Rating Type: STANDBY **Certification:**

General Performance Data

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL RATE LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
300.0	100	449	221	0.357	22.9	188.6	40.8	861.7	1,235.5	1,001.8	2,450.8
270.0	90	403	199	0.359	20.7	185.0	35.3	805.2	1,199.5	980.8	2,249.5
240.0	80	359	177	0.362	18.5	182.8	29.8	741.6	1,163.7	960.1	2,037.7
225.0	75	337	166	0.364	17.5	182.1	27.0	706.3	1,144.8	950.0	1,931.7
210.0	70	315	155	0.367	16.5	181.6	24.3	674.5	1,124.8	939.7	1,829.3
180.0	60	272	134	0.374	14.6	178.9	19.5	614.5	1,076.4	912.2	1,628.0
150.0	50	230	113	0.384	12.6	175.6	15.2	558.0	1,015.5	873.7	1,437.3
120.0	40	189	93	0.399	10.8	173.5	11.3	512.1	942.8	821.5	1,264.3
90.0	30	146	72	0.423	8.8	172.4	7.6	462.6	854.4	754.2	1,084.2
75.0	25	125	61	0.443	7.9	174.6	6.0	437.9	804.7	714.6	988.8
60.0	20	103	51	0.472	7.0	176.7	4.5	413.2	750.0	670.3	893.5
30.0	10	59	29	0.572	4.8	178.9	2.0	367.3	624.4	565.7	713.4

Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
300.0	100	11,374.0	3,827.0	18,312.0	10,748.0	2,627.0	1,570.0	19,051.0	49,363.0	52,605.0
270.0	90	10,350.0	3,372.0	16,663.0	9,668.0	2,371.0	1,200.0	17,118.0	44,586.0	47,486.0
240.0	80	9,327.0	2,986.0	15,071.0	8,701.0	2,133.0	836.0	15,241.0	40,036.0	42,596.0
225.0	75	8,872.0	2,809.0	14,331.0	8,189.0	2,013.0	660.0	14,274.0	37,818.0	40,264.0
210.0	70	8,360.0	2,639.0	13,535.0	7,734.0	1,894.0	500.0	13,364.0	35,601.0	37,932.0
180.0	60	7,450.0	2,309.0	12,113.0	6,824.0	1,672.0	245.0	11,545.0	31,392.0	33,383.0
150.0	50	6,483.0	1,990.0	10,748.0	5,971.0	1,450.0	45.0	9,725.0	27,184.0	29,004.0
120.0	40	5,573.0	1,683.0	9,384.0	5,061.0	1,234.0	-114.0	8,019.0	23,146.0	24,682.0
90.0	30	4,663.0	1,382.0	8,076.0	4,095.0	1,018.0	-245.0	6,199.0	19,051.0	20,303.0
75.0	25	4,208.0	1,234.0	7,450.0	3,640.0	910.0	-307.0	5,289.0	17,061.0	18,198.0
60.0	20	3,753.0	1,086.0	6,824.0	3,185.0	802.0	-358.0	4,379.0	15,014.0	16,037.0

CATERPILLAR®

TECHNICAL DATA

Open Generator Set - - 1800 rpm/60 Hz/480 Volts	DM8168	
Tier 3		
Generator Set Package Performance		
Genset Power rating @ 0.8 pf	375 kVA	
Genset Power rating with fan	300 ekW	
Coolant to aftercooler		
Coolant to aftercooler temp max	49 ° C	120 ° F
Fuel Consumption		
100% load with fan	86.1 L/hr	22.7 Gal/hr
75% load with fan	66.7 L/hr	17.6 Gal/hr
50% load with fan	51.3 L/hr	13.6 Gal/hr
Cooling System[1]		
Ambient air temperature	49 ° C	120 ° F
Air flow restriction (system)	0.12 kPa	0.48 in. water
Air flow (max @ rated speed for radiator arrangement)	497 m³/min	17551 cfm
Engine Coolant capacity with radiator/exp. tank	36.0 L	9.5 gal
Engine coolant capacity	22.0 L	5.8 gal
Radiator coolant capacity	14.0 L	3.7 gal
Inlet Air		
Combustion air inlet flow rate	25.7 m³/min	907.6 cfm
Exhaust System		
Exhaust stack gas temperature	499.5 ° C	931.1 ° F
Exhaust gas flow rate	69.7 m³/min	2461.4 cfm
Exhaust flange size (internal diameter)	170 mm	7 in
Exhaust system backpressure (maximum allowable)	5.9 kPa	23.7 in. water
Heat Rejection		
Heat rejection to coolant (total)	121 kW	6881 Btu/min
Heat rejection to exhaust (total)	309 kW	17573 Btu/min
Heat rejection to aftercooler	89 kW	5061 Btu/min
Heat rejection to atmosphere from engine	43 kW	2445 Btu/min
Heat rejection to atmosphere from generator	21.9 kW	1245.5 Btu/min
Alternator[2]		
Motor starting capability @ 30% voltage dip	682 skVA	
Frame	LC5014J	
Temperature Rise	150 ° C	270 ° F
Lube System		
Sump refill with filter	40.0 L	10.6 gal
Emissions (Nominal)[3]		
NOx g/hp-hr	4.11 g/hp-hr	
CO g/hp-hr	.25 g/hp-hr	
HC g/hp-hr	.06 g/hp-hr	
PM g/hp-hr	.033 g/hp-hr	

[1] Ambient capability at 300m (984 ft) above sea level. For ambient capability at other altitudes, consult your Caterpillar dealer. Air flow restriction (system) is added to existing restriction from factory. Generator temperature rise is based on a 40 C (104 F) ambient per NEMA MG1-32

[2] Generator temperature rise is based on a 40° C (104° F) ambient per NEMA MG1-32.

[3] Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state operating conditions of 77°F, 28.42 in HG and number 2 diesel fuel with 35° API and LHV of 18,390 btu/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle.

Appendix E
Air Dispersion Modeling Protocol with Approval Letter

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
TONI HARDESTY, DIRECTOR

April 26, 2007

Rick McCormick
CH2M Hill
Boise, Idaho

RE: Modeling Protocol for the St. Lukes Regional Medical Center Hospital Proposed to be Located in Twin Falls, Idaho

Rick:

DEQ received your dispersion modeling protocol on April 12, 2007. The modeling protocol was submitted on behalf of St. Lukes. The modeling protocol proposes methods and data for use in the ambient impact analyses of a Permit to Construct application for a new hospital in Twin Falls, Idaho.

The modeling protocol has been reviewed and DEQ has the following comments:

- Comment 1: The proposed receptor grid appears reasonable. However, it is the applicant's responsibility to use a sufficiently tight receptor network such that the maximum modeled concentration is reasonably resolved. If DEQ conducts verification modeling analyses with a tighter receptor grid and compliance with standards is no longer demonstrated, the permit will be denied.

- Comment 2: The following are background concentration values that should be used for Twin Falls:

PM10	24-hour = 55 $\mu g/m^3$;	annual = 26.0 $\mu g/m^3$	
NO2	annual = 40 $\mu g/m^3$		
CO	1-hour = 13,800 $\mu g/m^3$;	8-hour = 4,600 $\mu g/m^3$	
SO2	3-hour = 120 $\mu g/m^3$;	24-hour = 40 $\mu g/m^3$;	annual = 10 $\mu g/m^3$

  Background PM10 values are based on monitoring data from Twin Falls. Other background values are default background concentrations for urban areas.

DEQ's modeling staff considers the submitted dispersion modeling protocol, with resolution of the additional items noted above, to be approved. It should be noted, however, that the approval of this modeling protocol is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the *State of Idaho Air Quality Modeling Guideline*, which is available on the Internet at http://www.deq.state.id.us/air/permits_forms/permitting/modeling_guideline.pdf, for further guidance.

To ensure a complete and timely review of the final analysis, our modeling staff requests that electronic copies of all modeling input and output files (including BPIP and AERMAP input and output files) are submitted with an analysis report. If DEQ provided model-ready meteorological data files, then these do not need to be resubmitted to DEQ with the application. If you have any further questions or comments, please contact me at (208) 373-0112.

Sincerely,

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

Air Dispersion Modeling Protocol for St. Lukes Regional Medical Center Permit Application, Twin Falls, Idaho

(15-dayPermit Construction Approval)

Boise, Idaho

Prepared for

St. Lukes Regional Medical Center

Submitted to:

Idaho Department of Environmental Quality

April 2007

Prepared By:

CH2MHILL

Brief Project Background

St. Luke's Regional Medical Center is in the process of preparing a 15- Day Permit-to-Construct (PTC) for a new full service hospital that will provide impatient and outpatient health care. The new hospital will be located in Twin Falls, Twin Falls County, Idaho. The Central Plant hospital building will consist of 20 dual fuel boilers and 4 emergency generators for supplying building heat, steam instrument sterilization, and emergency electric power for maintaining hospital operations. There are 16-dual fuel boilers proposed each with a heat input rating of 2.0 MMBtu/hr for supplying building heat to all of the hospital buildings. A second set of four–dual fuel boilers each with a heat input rating of 4.184 MMBtu/hr will be used to make steam for instrument sterilization. All boilers will utilize natural gas as the primary fuel and propane as a backup fuel. Four-1500 kW diesel emergency generators will be used to provide emergency power for all hospital operations. One-300 kW emergency generator will be designated to the Medical Office Building for emergency power. There will be two cooling towers and five underground storage tanks (USTs) present at the hospital.

An air quality impact analysis will be performed in support of the Pre-Permit Construction approval per IDAPA 58.01.01.213. Idaho regulation requires the facility applying for a 15-Day PTC to demonstrate pre-compliance with the National Ambient Air Quality Standards (NAAQS) and with Toxic Air Pollutant (TAP) standards (IDAPA 58.01.01.210).

This air dispersion modeling protocol is being submitted to the Idaho Department of Environmental Quality (IDEQ) for approval prior to the initiation of the air quality modeling for the hospital. This document summarizes the modeling methodology that will be used to evaluate the hospital's impacts to air quality with respect to criteria and toxic air pollutants. It has been prepared based on the U.S. Environmental Protection Agency (EPA) *Guidelines on Air Quality Models* (GAQM), and the *State of Idaho Air Quality Modeling Guideline* (ID AQ-01, December 31, 2002).

Source Description

The modeling will be performed using ten individual sources which include boilers, generators, cooling fans and an UST vent. Sources will be primarily modeled as point sources except the cooling fans and UST vent which will be modeled as volume sources. The hospital will operate 16-dual fuel boilers (HBOIL1) that will be manifolded to a single exit stack and provide heat to the hospital buildings. These boilers will use natural gas primarily and propane as a backup fuel. There will also be four-dual fuel boilers (SBOIL2) that will process steam for sterilization. The four steam boilers manifold to a single exit stack. These boilers are primarily run on natural gas and propane as backup fuel. There will be one-300 kW generator that will be used to provide emergency power to the MOB (GEN1). There will be four-1500 kilowatt (kW) diesel generators (GEN2-5) that will be used to provide emergency power to the other hospital buildings. The Central

Plant building will have two cooling fans (WCT1, WCT2). There will be one 12,000 gallon jet fuel UST (UST12000) located immediately east of the helipad that will need to be included in the modeling. There are four-15,000 gallon diesel USTs whose breathing loss emissions are considered insignificant for modeling purposes and will not be included in the modeling. Emissions from these diesel tanks will be included in the permit application.

Emission Control Description

There will be no emission controls for any of the emitting sources at the hospital.

Source Parameters

Average flow rates and temperatures provided by the manufacturer will be used for the dual-fuel boilers and emergency generators. The Caterpillar supplied manufacturer data for the 300 kW and 1500 kW emergency generators are based on an average hospital operating load of 40%. The source parameters for the hospital sources are summarized in Tables 1a and 1b. A facility layout showing the location of buildings and emissions sources will be included in the final report. These parameters are based on preliminary design information, and may be updated in the permit application.

Table 1a . Stack Parameters

Source ID	Source Description	Stack Height	Temperature	Exit Velocity	Stack Diameter
		(m)	(K)	(m/s)	(m)
HBOIL1	Heat boiler	10.06	378.15	12.51	0.71
SBOIL2	Steam boiler	10.06	477.59	10.05	0.56
GEN1	300 kW generator	14.63	711.76	47.10	0.13
GEN2	1500 kW generator #1	10.06	635.04	85.89	0.20
GEN3	1500 kW generator #2	10.06	635.04	85.89	0.20
GEN4	1500 kW Generator #3	10.06	635.04	85.89	0.20
GEN5	1500 kW Generator #4	10.06	635.04	85.89	0.20

Table 1b. Volume Sources

Source ID	Source Description	Release Height	Horizontal Dimension	Vertical Dimension
		(m)	(m)	(m)
WCT1	Watercooling fan #1	4.24	0.79	1.97
WCT2	Water cooling fan #2	4.24	0.79	1.97

Table 1C. Area Sources

Source ID	Source Description	Release Height	X Length	Y Length
		(m)	(m)	(m)
UST12000	12000 gallon jet fuel	3.66	0.05	0.05

Emissions

The annual emission rates for the boilers are based on the sum 8,760 hours using natural gas and 96 hours using propane per year. Short term boiler emission rates will be based on the higher hourly emission rate of either natural gas or propane by pollutant. The emission rates for the diesel generators are based on 500 hours of operation per year. The estimated criteria emissions by source and pollutant are shown in Tables 2 and 3. VOC emissions will not be modeled because VOC is regulated as a precursor to ozone and there is no ambient standard for VOC. The emission rates included in this analysis are subject to change.

TAP emissions will be estimated and compared to the screening emission limits (EL) specified in the regulation (IDAPA 58.01.01 585 and 586). Modeling will be performed for those TAPs whose emission estimate is greater than the EL. Table 4 show those TAPs with emissions above the EL, for which modeling will be required.

Table 2. Annual Emission Rates in tons/year

Source ID	PM_{10}	NO_x	SO_2	CO	VOC
HBOIL1*	1.051	9.640	0.083	10.824	0.149
SBOIL2*	0.546	4.920	0.043	5.645	0.035
GEN1	0.205	2.325	0.232	0.700	0.040
GEN2	0.050	7.245	2.231	0.988	0.178
GEN3	0.050	7.245	2.231	0.988	0.178
GEN4	0.050	7.245	2.231	0.988	0.178
GEN5	0.050	7.245	2.231	0.988	0.178
UST12000	-	-	-	-	0.126
WCT1	1.272	-	-	-	-
WCT2	1.272	-	-	-	-

* For boilers, the emission rates are based on the sum of natural gas and propane year per year.

Table 3. Maximum Hourly Emission Rates in pounds/hour

Source ID	PM_{10}	NO_x	SO_2	CO	VOC
HBOIL1	0.238	4.896	0.019	2.464	0.175
SBOIL2	0.125	1.123	0.010	1.289	0.008
GEN1	0.820	9.300	0.930	2.800	0.160
GEN2	0.200	28.980	8.923	3.950	0.710
GEN3	0.200	28.980	8.923	3.950	0.710
GEN4	0.200	28.980	8.923	3.950	0.710
GEN5	0.200	28.980	8.923	3.950	0.710
UST12000	-	-	-	-	0.029
WCT1	0.290	-	-	-	-
WCT2	0.290	-	-	-	-

* For boilers, the emission rates are based on the higher emission rate of either natural gas or propane by pollutant

Table 4. Maximum Hourly Emissions for Toxic Air Pollutants in pounds/hour							
Source ID	Ethylbenzene	Benzene	Form.	PAH	Arsenic	Cadmium	Nickel
HBOIL1		6.59E-05	2.35E-03		6.27E-06	3.45E-05	6.59E-05
SBOIL2		3.45E-05	1.23E-03		3.28E-06	1.80E-05	3.45E-05
GEN1		2.99E-03	3.78E-03	5.39E-04			
GEN2		1.14E-02	1.16E-03	3.11E-03			
GEN3		1.14E-02	1.16E-03	3.11E-03			
GEN4		1.14E-02	1.16E-03	3.11E-03			
GEN5		1.14E-02	1.16E-03	3.11E-03			
UST12000	2.47E-04	5.71E-05					

Note: TAPS with annual criteria will adjusted for annual hours of operation in final report.

Regulatory Review

Standards and Criteria Levels

Table 5 summarizes applicable criteria including:

- Significant contribution levels (SCL),
- National Ambient Air Quality Standards (NAAQS).

Table 5. Regulatory Standards and Significance Levels

Pollutant	Averaging	NAAQS		SCL
	Period	µg/m³	ppm	(µg/m³)
CO	8-Hour	10,000	9	500
	1-Hour	40,000	35	2,000
NO_2	Annual	100	0.053	1
PM_{10}	Annual	--	--	1
	24-Hour	150	--	5
$PM_{2.5}$	Annual	15	--	--
	24-Hour	35	--	--
SO_2	Annual	80	0.03	1
	24-Hour	365	0.14	5
	3-Hour	1300	0.5	25

Modeled concentrations will be compared to the applicable Idaho significant contribution levels (SCL) shown in Table 5. If the predicted impacts are not significant (that is, less than the SCL), the modeling is complete for that pollutant under that averaging time. If impacts are significant, a more refined analysis will be conducted for demonstration of compliance with the NAAQS. A description of the modeling methodology is presented below.

Dispersion Model

The EPA-approved AERMOD (Version 07026) model will be used. AERMOD is a steady-state plume model that simulates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. This model is recommended for short range (< 50 km) dispersion from the source. The model incorporates the ISC Prime algorithm for modeling building downwash, which was developed to address deficiencies in the downwash algorithm previously used in the ISC model. AERMOD is designed to accept input data prepared by two specific pre-processor programs, AERMET and AERMAP. IDEQ adopted the federal mandate requiring the use of the AERMOD dispersion model for permit applications on November 9, 2006. AERMOD will be run with the following options.

- Regulatory default options,
- Direction-specific building downwash,
- Actual receptor elevations and hill height scales,
- Complex/intermediate terrain algorithms.

Building Downwash

Building influences on stacks are considered by incorporating the updated EPA Building Profile Input Program [BPIP-Prime]. The stack heights used in the dispersion modeling will be the actual stack height or Good Engineering Practice (GEP) stack height, whichever is less.

Meteorological Data

Twin Falls meteorological data will be used for this modeling analysis. The Twin Falls AERMET data was provided by IDEQ from another project site and included data for 1999 through 2003. The data includes Boise upper air data and Twin Falls surface data. For PM_{10} and TAPs modeling a combined data file for all five years will be used according to IDEQ request. For all other pollutants a data file for each year will be used.

Ambient Conditions

Background concentrations for this facility will be provided by IDEQ. The completed Table 6 will be included with the final report.

Table 6. Background Criteria Pollutant Concentrations ($\mu g/m^3$)

Pollutant	1-hr	3-hr	8-hr	24-hr	Annual
NO_x					
SO_2					
PM_{10}					
CO					

Receptors

The selection of receptors in AERMOD will be as follows:

- The 25-meter grid will extend approximately 100 km around the facility, and
- The 50-meter grid will extend approximately 1 km.
- The 500-meter grid will extend approximately 5 km,

A second run using a fine receptor grid will be centered on the point of maximum impact and re run using a 50 meter grid spacing, unless the initial maximum occurs on the fenceline. Receptor elevations will be calculated by AERMAP as described below.

AERMAP will be run to process terrain elevation data for all sources and receptors using 7.5 minute Digital Elevation Model (DEM) files prepared by the USGS. AERMAP first determines the base elevation at each source and receptor. For complex terrain situations, AERMOD captures the physics of dispersion and creates elevation data for the surrounding terrain identified by a parameter called hill height scale. AERMAP creates hill height scale by searching for the terrain height and location that has the greatest influence on dispersion for each individual source and receptor. Both the base elevation and hill height scale data are produced for each receptor by AERMAP as a file or files which can be directly accessed by AERMOD.

Preliminary Analysis

The preliminary analysis for each pollutant will be conducted as follows:

- If the predicted impacts are not significant (that is, less than the SCL) for each criteria pollutant, the modeling is complete for that pollutant under that averaging time.
- If impacts are significant, a more refined analysis, as described below, will be conducted.
- For NO_x, it will be initially assumed that all NO_x is converted to NO_2. If the resulting concentration exceeds the SCL, then the concentration will be multiplied by the default annual NO_2/NO_x ratio of 0.75 as suggested by EPA and compared to the SCL again. If the resulting concentrations still exceed the SCL, then a refined analysis will be conducted.
- Toxic pollutant impacts will be compared to the acceptable ambient concentrations for non-carcinogens or carcinogens, as applicable.

Refined Analyses – Criteria Pollutants

- Comparison to the Ambient Air Quality Standards
  - For pollutants with concentrations greater than the SCLs, the maximum concentration will be determined and compared to the NAAQS. This maximum concentration will include contributions from the facility, nearby sources, and ambient background concentrations. Background concentrations to be provided by IDEQ will be used to determine concentrations.
  - IDEQ will be contacted to identify nearby sources, if any, that need to be included in the analysis.

Output - Presentation of Results

The results of the air dispersion modeling analyses will be presented as follows:

- A description of modeling methodologies and input data,
- A summary of the results in tabular and, where appropriate, graphical form,
- Modeling files used by AERMOD will be provided with the application on compact disk,
- Any deviations from the methodology proposed in this protocol will be presented.

Appendix F
Air Dispersion Modeling Report

Air Dispersion Modeling Report for St. Lukes Regional Medical Center Permit Application, Twin Falls, Idaho

15-Day Permit Construction Approval

Prepared for:

St. Lukes Regional Medical Center

Submitted to:

Idaho Department of Environmental Quality

May 2007

Prepared By:

CH2MHILL

Introduction

A modeling report has been prepared for St. Lukes Magic Valley Medical Center. The following paragraphs describe the modeling methodology, inputs and results. Any deviations from the modeling protocol are also discussed.

Modeling Methodology

The EPA-approved AERMOD (Version 07026) model was used. AERMOD is a steady-state plume model that simulates air dispersion based on planetary boundary layer turbulence structure and scaling concepts. The model incorporates the ISC Prime algorithm for modeling building downwash, which was developed to address deficiencies in the downwash algorithm previously used in the ISC model. IDEQ adopted the federal mandate requiring the use of the AERMOD dispersion model for permit applications on November 9, 2006. AERMOD was run with the following options.

- Regulatory default options,
- Direction-specific building downwash,
- Actual receptor elevations and hill height scales,
- Complex/intermediate terrain algorithms.

The receptor grid described in the protocol was used.

Meteorological Data

Twin Falls meteorological data was used for this modeling analysis. Twin Falls is representative of the hospital site. The Twin Falls data was provided by IDEQ from another project site and included data for 1999 through 2003. The data includes Boise upper air data and Twin Falls surface data. When modeling carcinogenic toxic air pollutants and particulates, a 5 year meteorological data set was used with a period average concentration.

Modeling Inputs

Stack parameter information and generator run-time hours have been adjusted to account for dispersion modeling refinements. Stack parameters are defined in Tables 1a through 1c.

Annual run time hours for the four 1,500 kW emergency standby generators were reduced from 500 hours per year to 200 hours per year. The 300 kW MOB generator will operate a maximum of 500 hours per year. Hourly maintenance testing for the Central Heat Plant emergency standby generators(GEN2-GEN5) will be limited to one diesel generator 6 hours per day (24-hour period). No more than one generator shall be tested per day.

Table 2 shows the emission rates modeled in AERMOD for criteria pollutants and changes to the hourly rates based on permit limits. Table 3 shows all the toxic emission rates modeled in AERMOD based on an annual averaging period.

Source Information

A facility layout showing the location of buildings and emissions sources are included in Figure 2.

Table 1a . Point Sources

Source ID	Source Description	Stack Height	Temperature	Exit Velocity	Stack Diameter
		(m)	(K)	(m/s)	(m)
SBOIL2	Steam boiler	10.06	477.59	10.05	0.56
HBOIL1	Bldg Heat boiler	10.06	378.15	12.51	0.71
GEN1	300 kW generator #1	14.63	711.76	47.10	0.13
GEN2	1500 kW generator #2	10.06	635.04	85.89	0.20
GEN3	1500 kW generator #3	10.06	635.04	85.89	0.20
GEN4	1500 kW Generator #4	10.06	635.04	85.89	0.20
GEN5	1500 kW Generator #5	10.06	635.04	85.89	0.20

Table 1b. Area Sources

Source ID	Source Description	Release Height	Easterly Length	Northerly Length
		(m)	(m)	(m)
UST12000	12,000 gallon jet fuel	3.66	0.05	0.05

Table 1c. Volume Sources

Source ID	Source Description	Release Height	Horizontal Dimension	Vertical Dimension
		(m)	(m)	(m)
WCT1	Water Cooling tower #1	7.89	0.79	3.67
WCT2	Water Cooling tower #2	7.89	0.79	3.67

Emission Controls

No emission controls are used to control criteria emissions from the plant.

Table 2. Criteria Emission Rates used in AERMOD

	Annual Emissions (tons/year)			Short Term Emissions (pounds/hour)				
Source ID	NO_X *	PM_{10}*	SO_2*	PM_{10}**	3 HR SO_2	24 HR SO_2**	1 HR CO	8 HR CO***
GEN1	1.02E+00	1.00E-02	2.32E-01	0.03E-00**	9.20E-01	2.30E-01	2.50E-01	1.88E-01
SBOIL2	3.72E+00	5.46E-01	4.30E-02	1.25E-01	1.00E-02	1.00E-02	1.38E+00	1.38E+00
HBOIL1	7.11E+00	1.05E+00	8.30E-02	2.38E-01	1.88E-02	1.88E-02	2.64E+00	2.64E+00
GEN2	2.90E+00	2.00E-02	8.92E-01	5.00E-02	8.92E+00	2.23E+00	3.95E+00	2.96E+00
GEN3	2.90E+00	2.00E-02	8.92E-01	5.00E-02	8.92E+00	2.23E+00	3.95E+00	2.96E+00
GEN4	2.90E+00	2.00E-02	8.92E-01	5.00E-02	8.92E+00	2.23E+00	3.95E+00	2.96E+00
GEN5	2.90E+00	2.00E-02	8.92E-01	5.00E-02	8.92E+00	2.23E+00	3.95E+00	2.96E+00
UST12000	-	-	-	-	-	-	-	-
WCT1	-	1.272	-	0.290	-	-	-	-
WCT2	-	1.272	-	0.290	-	-	-	-

*Annual emission rates for generator 1 are based on operating 500 hours per year and annual emission rates for generators 2, 3, 4, and 5 were each adjusted to operate 200 hours per year.

**24-HR SO_2 and PM_{10} emission rates for each generator were adjusted to 6 hours of operation per 24 hour period. For GEN1 24 HR PM10, there was no adjustment for 6 hours of operation.

***8-HR CO emission rates for each generator were adjusted for 6 hours of operation per 8 hour period.

Table 3. Hourly Emissions for Toxic Air Pollutants in pounds/hour

Source ID	ETHYL	BENZENE	FORM	PAH	ARSENIC	CAD	NICKEL
GEN1	-	1.69E-04	2.14E-04	1.51E-05	-	-	-
SBOIL2	-	3.44E-05	1.23E-03	-	3.28E-06	1.80E-05	3.44E-05
HBOIL1	-	6.59E-05	2.35E-03	-	6.28E-06	3.45E-05	6.59E-05
GEN2	-	2.60E-04	2.64E-05	2.74E-05	-	-	-
GEN3	-	2.60E-04	2.64E-05	2.74E-05	-	-	-
GEN4	-	2.60E-04	2.64E-05	2.74E-05	-	-	-
GEN5	-	2.60E-04	2.64E-05	2.74E-05	-	-	-
UST12000	2.47E-04	-	-	-	-	-	

Note: Emission rates for generator 1 were adjusted to operate 500 hours per year (ton per year value) and averaged over 8,760 hours per year. Example Calculation:1,3 Butadiene = (3.1E-05 ton/yr)*(2000 lb/ton)*(1 yr/8760 hr/yr) = 7.09E-06 lb/hr

Emission rates for generators 2, 3, 4, and 5 were each adjusted to operate 200 hours per year.

Table 3. Hourly Emissions for Toxic Air Pollutants in pounds/hour

The UST emissions were multiplied by 100 to enter the model and the output was divided by 100.

Ambient Conditions

Background concentrations included in Table 4 were provided by IDEQ in the Modeling Protocol approval letter dated April 26, 2007.

Table 4. Background Criteria Pollutant Concentrations (µg/m3)

Pollutant	1-hr	3-hr	8-hr	24-hr	Annual
NO_x	-	-	-	-	40
SO_2	-	120	-	40	10
PM_{10}	-	-	-	55	26
CO	13,800	-	4,600	-	-

Note: Data provided by IDEQ, April 26, 2007.

Receptors

The selection of receptors in AERMOD was as follows:

- The 25-meter grid extending approximately 100 m around the facility, and
- The 50-meter grid extending approximately 1 km.
- The 500-meter grid extending approximately 5 km,

Results

The modeling results are summarized in Table 5. There are no co-contributing sources within 1 kilometer of the facility; therefore, no additional sources are required to be modeled.

The overall modeled impacts are below the Ambient Air Quality Standards. The overall impacts include background concentrations and the maximum modeled concentration by pollutant and averaging period. Toxic air pollutant (TAP) modeled concentrations were compared to acceptable ambient concentrations for carcinogens (AACC). Each TAP was below the AACC with exception of cadmium. A T-RACT analysis for cadmium emissions is included in Appendix G.

All modeled impacts occur at receptors nearest the buildings, where the spacing was 25 meters; therefore no additional refined analysis was needed.

The modeling files are attached on CD.

Table 5. Modeling Results for St Lukes Twin Falls Medical Center (units ug/m3)

Pollutant	Averaging Period	Criteria	Background	Modeled Conc.	Overall Modeled Conc.	Below Criteria	Year	Location
Criteria Pollutants								
CO	1-HR	40,000	13,800	1184.0	14,984	Yes	2000	adjacent to buildings
CO	8-HR	10,000	4,600	696.4	5,296	Yes	2003	adjacent to buildings
NO_2	ANNUAL	100	40	53.4	93	Yes	2003	adjacent to buildings
PM_{10}	24-HR[2]	150	55.0	42.3	97	Yes	1999-2003	adjacent to buildings
	ANNUAL[2]	50	26	10.9	37	Yes	1999-2003	adjacent to buildings
SO_2	ANNUAL	80	10	6.8	17	Yes	2003	adjacent to buildings
	24-HR	365	40	318.3	358	Yes	2000	adjacent to buildings
	3-HR[3]	1300	120	576.0	696	Yes	2002	adjacent to buildings
Toxics								
Arsenic[2]	Annual	0.0002	0	0.00016		Yes	1999-2003	adjacent to buildings
Benzene[2]	Annual	0.1200	0	0.00892		Yes	1999-2003	adjacent to buildings
Cadmium[2]	Annual	0.0006	0	0.0009		No	1999-2003	adjacent to buildings
Ethyl Benzene[4]	24-HR	21750	0	0.0000526		Yes	1999-2003	adjacent to buildings
Formaldehyde[2]	Annual	0.0770	0	0.06141		Yes	1999-2003	adjacent to buildings
Nickel[2]	Annual	0.0042	0	0.00171		Yes	1999-2003	adjacent to buildings
Total PAHs[2]	Annual	0.0140	0	0.00081		Yes	1999-2003	adjacent to buildings

Notes

[1] The 24-Hour PM10 concentration is for the 6th High

[2] The toxics and Annual PM10 concentration used a combined 5 year meteorological data file.

[3] Maximum 3 HR SO_2 concentration occurs when Generator 2 is being tested

[4] The modeling output for ethyl benzene was divided by 100.

Appendix G
T-RACT Analysis

T-RACT ANALYSIS

Cadmium Emissions
St. Luke's Magic Valley Medical Center
Twin Falls, Idaho

St. Luke's Regional Medical Center is constructing a new hospital, St. Luke's Magic Valley Medical Center (SLMVMC), in Twin Falls, Idaho. This new facility will maintain a Central Heat Plant building containing four 4.18 MMBtu/hr natural gas-fired steam boilers, and 16-2.0 MMBtu/hr natural gas-fired heating boilers. Modeled emission rates for cadmium (Cd), an Idaho toxic air pollutant, indicated that the ambient concentration of Cd will exceed allowable ambient concentrations for carcinogens (AACC) at one of the Pole Line Road receptors. Emissions of this pollutant are based on the emission factors contained in the Environmental Protection Agency (EPA) AP-42 database. In accordance with Idaho Rules for the Control of Air Pollution, a Toxics Reasonably Available Control Technology (T-RACT) was performed for Cd emissions from the heating and steam boilers.

The definition of T-RACT is:

> "An emission standard based on the lowest emission of toxic air pollutants that a particular source is capable of meeting by the application of control technology that is reasonably available, as determined by the Department, considering technological and economic feasibility. If control technology is not feasible, the emission standard may be based on the application of a design, equipment, work practice or operational requirement, or combination thereof"

The T-RACT analysis determines what level of control could reasonably be achieved for the control of Cd emissions. The T-RACT must be technically feasible, environmentally sound, and economically achievable. Idaho T-RACT regulations are found at IDAPA 58.01.01.210.14.

Emissions Sources

The Central Heat Plant will maintain the boilers to provide heat and steam for hospital use. Natural gas will be the primary fuel and propane will be used as backup fuel. The emission source breakdown is shown on Table 1.

Table 1 SLRMC Natural Gas-Fired Combustion Sources.

Source ID	Stationary Sources
	Point Sources
HBOIL 1-16	Hospital Heat Boilers (16 small heat sources, @ 2mm/BTU/hr heat rating)
	Equivalent to One Boiler Total Heat Input 2MMBTU * 16 units = 32 MMBTU/hr
SBOIL 1-4	Hospital Steam Boilers (4 small boilers for building steam, @ 4.18MMBTU/hr heat rating)
	Equivalent to One Boiler Total Heat Input 4.18MMBTU * 4 units = 16.72 MMBTU/hr

All 16 of the 2 MMBTU/hr rated heating boilers exhaust into a common manifold and emit through a common stack. Additionally, all four of the 4.18 MMBTU/hr rated steam boilers exhaust into a common manifold and emit through a separate and proximate common stack. These stacks are fixed by the physical layout of the SLRMC including the design and necessary layout of the building, the dimensions of the building site, and required location of the heat and steam boilers in the facility.

The fuel gas supplied to the SLMVMC heat and steam boilers is clean, pipeline quality natural gas as provided by Intermountain Gas or other commercial suppliers. SLMVMC has no control over the constituents or trace contaminants in this natural gas. Cd may or may not be present as a trace contaminant in natural gas. Cd does not naturally occur in natural gas and may be present as a result of the extraction, processing and transportation of the product. The EPA factor for Cd in natural gas is a trace quantity of 0.0011 pounds of Cd per million cubic feet of natural gas. Cd emissions factors obtained from the US EPA AP-42 database are of an admitted low quality, having a "D" rating. Other emission factors or test data are not available.

The heat and steam boilers are new, current technology, low nitrogen oxide (NOx), high efficiency gas-combustion units. They are designed to provide heat and steam to the hospital in an efficient manner using natural gas as the primary fuel and propane as backup. Due to the clean-burning nature of natural gas and propane, and the very small size of the heating and steam generating units, no control devices are installed on these units. Ambient air dispersion modeling was performed on the emissions of the small heat and steam boilers. The results of the air dispersion modeling are shown on Table 2.

Table 2. Modeling Results for St Luke's Twin Falls Medical Center (units ug/m3)

Pollutant	Averaging Period	Background	Modeled Conc.	Overall Modeled Conc.	AACC Criteria	Below Criteria?
Toxics						
Benzene**	Annual	0		0.00893	0.1200	Yes
Arsenic**	Annual	0		0.0001	0.0002	Yes
Cadmium**	Annual	0		0.0009	0.0006 ***	No
Nickel**	Annual	0		0.00171	0.0042	Yes
Formaldehyde**	Annual	0		0.06141	0.0770	Yes
1-3, Butadien**	Annual	0		0.00005	0.0036	Yes
Total PAHs**	Annual	0		0.00081	0.0140	Yes

Notes

*The 24-Hour PM10 concentration is for the 6th High

** The toxics and Annual PM10 concentration used a combined 5 year meteorological data file.

*** Rounded from AACC of 0.00056 ug/m3

The modeled emissions of Cd exceeded the AACC as listed in IDAPA 58.01.01.586. All other air toxics met the ambient criteria thresholds.

For the purposes of boilers for this T-RACT analysis, it was assumed that all 16-2.0MMBtu/hr heat boilers are summed together equivalent to one small 32MMBTU/hr commercial boiler. Similarly, all four 4.18 MMBTU/hr steam boilers are summed together to represent one 16.72 MMBTU/hr commercial boiler. T-RACT controls for these sized natural gas and propane-fired emissions sources were reviewed for the control of Cd emissions. The control technology review was performed by examining the EPA national database for emissions control technology that is reasonably available.

EPA RACT/BACT/LAER Clearinghouse Review

The Environmental Protection Agency (EPA) RACT/BACT/LAER (RBL) Clearinghouse is a compilation of existing and proposed control technologies, permit limits, and emission estimates for a very wide variety of process and emission point sources in the US. This database was developed and is maintained by the EPA to provide information on emissions control technology and other information for air pollutants. Boilers, in particular, have an extensive data set in the Clearinghouse due to the large number of these units installed in the US. The RBL was reviewed for information in the category "Commercial/Intuitional gas

and propane-fired and boilers less than 100MMBTU/hr in size" as the proposed heaters and boilers fall within this classification. The database was also queried for the pollutant, "cadmium and cadmium compounds". This boiler size query was elected since the "boilers" as defined in Table 1 are less than 100MMBTU in combined size. The Cd query was selected as Cd is the pollutant of concern. The Cd searches for natural gas and propane-fired boilers less than 100MMBTU/hr resulted in no matches found for any control technology applicable for control of Cd. A copy of the search criteria and the search results are attached. Based on this review of the EPA RBL, no control technologies were identified for natural gas and propane-fired boilers less than 100MMBTU/hr heat input for Cd.

T-RACT Analysis

The T-RACT determination procedure is defined at IDAPA 58.01.01.210.14. This procedure requires various aspects of control technologies to be considered. In the SLMVMC case for the small heating and steam boilers, a search of the national EPA RBL Clearinghouse demonstrated that no technologies were identified for the control of Cd. In addition, the plant site, design, and layout do not offer options to influence the point of emissions, and the raw material (natural gas and propane) constituents are not under the control of SLMVMC. Finally, the presence of Cd in the natural gas supplied to SLRMC is questionable given the poor quality rating of the EPA emission factors for this pollutant.

Since no control technologies for the control of Cd on small gas or propane-fired sources were identified, no cost-effectiveness analysis can or should be attempted. The small heating and steam boilers will be of current and efficient design and will be well-operated units. Good operation of these emission sources is concluded to be T-RACT.

Once T-RACT has been determined, IDAPA 58.01.01.210.12 allows for this determination to be used for pre-construction compliance for toxic air pollutants listed in IDAPA section 58.01.01.586. Cadmium is an air toxic listed in this section. A factor of 10 may be applied to the ambient concentration as allowed by IDAPA 58.01.01.210.12(b). The results of this AACC adjustment are shown in Table 3.

Table 3. T-RACT Adjusted Modeling Results for St Luke's Twin Falls Medical Center (units ug/m3)

Pollutant	Averaging Period	Background	Modeled Conc.	Overall Modeled Conc.	AACC Criteria	Below Criteria?
Toxics						
Benzene**	Annual	0		0.00893	0.1200	Yes
Arsenic**	Annual	0		0.0001	0.0002	Yes
Cadmium**	Annual	0		0.0009	0.006 ***	Yes
Nickel**	Annual	0		0.00171	0.0042	Yes
Formaldehyde**	Annual	0		0.06141	0.0770	Yes
1-3, Butadien**	Annual	0		0.00005	0.0036	Yes
Total PAHs**	Annual	0		0.00081	0.0140	Yes

Notes

*The 24-Hour PM10 concentration is for the 6th High

** The toxics and Annual PM10 concentration used a combined 5 year meteorological data file.

*** Rounded from AACC of 0.00056 ug/m3 * 10

Applying the T-RACT determination, the modeled concentration for Cd meets the AACC criteria.

Summary

CH2M HILL concludes that no control is reasonably available for the control of Cd emissions from small gas or propane-fired boilers less than 100MMBTU/hr. The building heat and steam boilers are of efficient and current design and will be well-operated. T-RACT for these small units is good operation.

Based on this T-RACT determination, an adjustment of the AACC for Cd is available under IDAPA 58.01.01.210.12. Applying a factor of 10 to the Cd AACC, the modeled ambient concentration of Cd meets the AACC in IDAPA 58.01.01.586.

In accordance with IDAPA 58.01.01.123, "based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate and complete."

Attachment
EPA RBL Clearinghouse Search Documents

SEARCH CRITERIA

U.S. Environmental Protectic

Technology Transfer Network
Clean Air Technology Center
RACT/BACT/LAER Clearinghouse

CATC Home

RBLC Home
Basic Information
Search Data Base
Data Entry
Products

State & Local Agency Links
Related Links
Technical Resources

Recent Additions
Contact US

RBLC Basic Search

Choose criteria from one or more of the groups listed below. You don't need to fill in all spaces. Default values are indicated.

Run search now | Reset form

Show All (•) Show 150 records per page

Help **PERMIT DATE**

From : 1/1/1997 (MM/DD/YYYY)

To: 5/9/2007 (MM/DD/YYYY)

Default = Last 10 years. Permits go back to 1970.

Help **PROCESS INFORMATION**

Process Type:

* 13.310 - Natural Gas (includes propane and liquefied petroleum

Process Name Contains: * Commercial / Institutional Boilers ≤ 100 mmBTU/hr

A blank box finds all processes under type specified above.

Help **POLLUTANT NAME**

Cadmium / Cadmium Compounds

Help **CORPORATE/COMPANY OR FACILITY NAME CONTAINS:**

A blank box finds all company and plant names.

Help **FACILITY STATE**

Cd SEARCH RESULTS

U.S. Environmental Protecti

Technology Transfer Network
Clean Air Technology Center
RACT/BACT/LAER Clearinghouse

RBLC Search Results

List of Reports

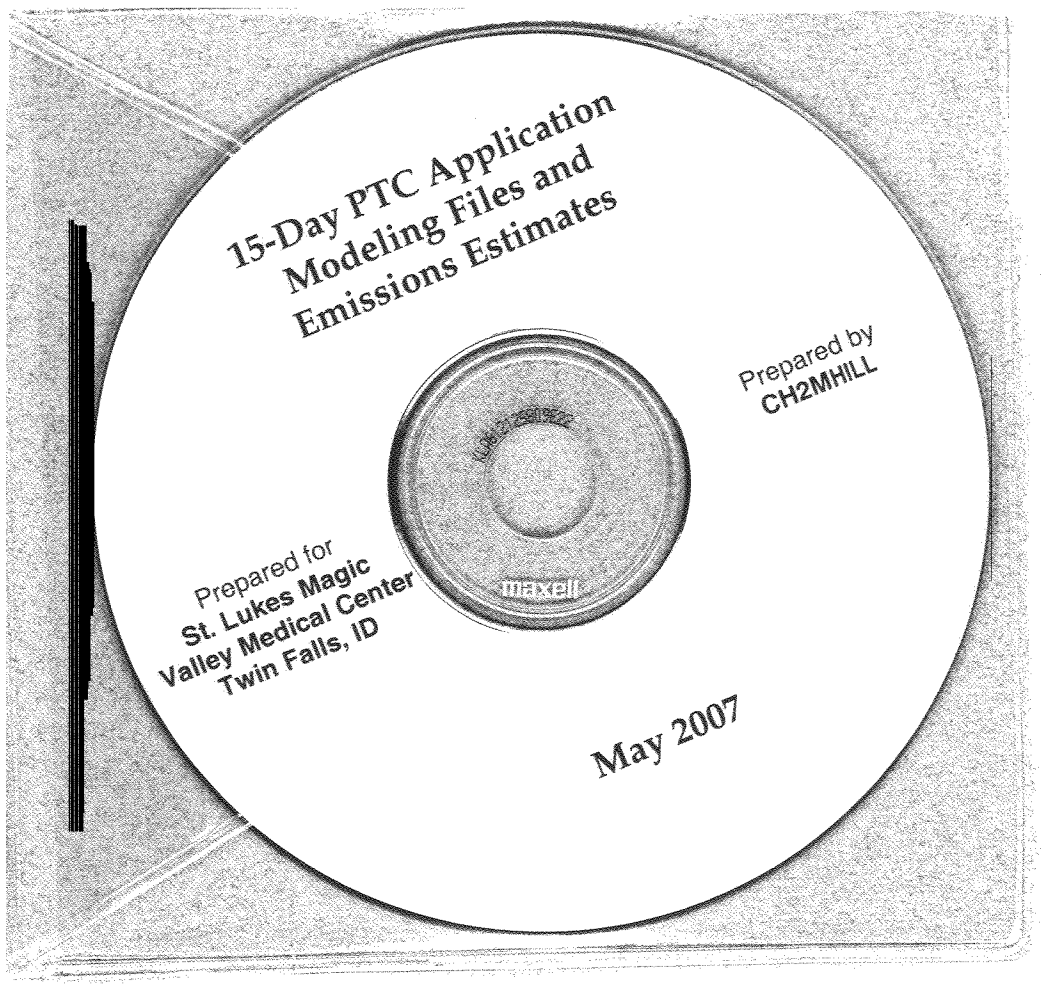
No matching RBLC facilities found.

Criteria used for search:

Permit Date Between 1/1/1997 And 5/9/2007
And Process Type Contains "13.31"
And Pollutant Name is Cadmium / Cadmium Compounds

You should go back to the standard search form and respecify the criteria you used or select another portion of th search.

Attachment
Modeling Files and
Emissions XL Spreadsheet Files CD


15-Day PTC Application
Modeling Files and
Emissions Estimates
Prepared by
CH2MHILL
Prepared for
St. Lukes Magic
Valley Medical Center
Twin Falls, ID
maxell
May 2007